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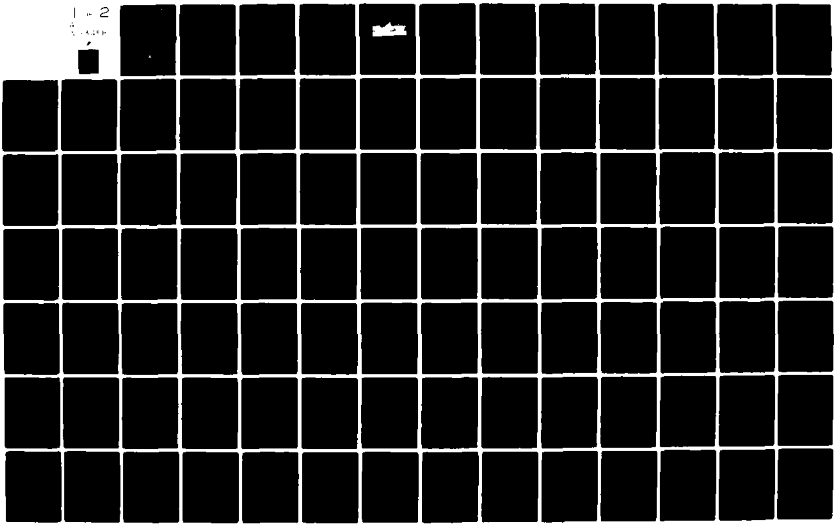

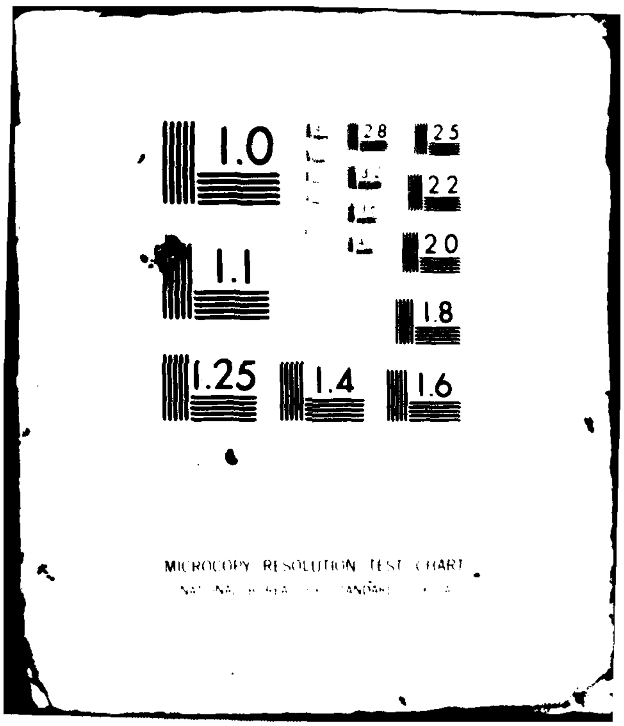
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NRL Report 8523

NRL 324-m^3 Chamber Pressurization Experiment: Pressurant Concentration Histories With and Without Obstacles to Flow

J. P. Stone, J. I. Alexander, T. T. Street,
H. J. St. Aubin, and F. W. Williams

Combustion and Fuels Branch
Chemistry Division

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Nitrogen pressurization of pressurizable enclosures is proposed for fire suppression. Implementation requires pressurant distribution information. Distribution histories, with and without flow obstacles, are reported as inferred from temperature measurements observed during pressurization of a 324-m^3 fire chamber from 1 to 2 atmospheres (101.3 to 202.6 kPa). For pressurant injection times of 10 and 30 s, pressurant and resident gases were judged to be well mixed within 1.6 injection times, and no grossly unmixed pockets were observed.

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CONTENTS

NRL 324-m^3 CHAMBER PRESSURIZATION EXPERIMENT: PRESSURANT CONCENTRATION HISTORIES WITH AND WITHOUT OBSTACLES TO FLOW

INTRODUCTION

Gas-mixing and scale-modeling studies continue in the new 324-m^3 fire-test facility at the Naval Research Laboratory (NRL). These studies extend previous studies conducted in the NRL 5-m^3 chamber and in its one-sixth-scale model at the University of Washington (UW). We explore further the concept of suppressing unwanted fires in pressurizable spaces by injection of nitrogen gas as proposed by Carhart and Fielding [1]. The chamber of this new facility is of sufficient size to allow realistic full-scale tests. Objectives of these tests were to place the new facility in operation, to infer pressurant gas-concentration histories from temperature (thermocouple) measurements during chamber pressurization from 1 to 2 atmospheres (101.3 to 202.6 kPa), and to present results in a convenient form consistent with the Corlett et al. scale-modeling hypothesis [2].

In this report, we describe the 324-m^3 chamber, its nitrogen pressure system, and experiments both with and without obstacles to flow, and we then present the reduced data.

DESCRIPTION OF EQUIPMENT

Figure 1 shows a view of the 324-m^3 facility as one looks to the southwest. The steel pressure vessel lies horizontally on two concrete piers; design pressure is 5 atmospheres (507 kPa) according to the ASME Unfired Pressure Vessel Code. The chamber was tested hydrostatically at 7.65 atmospheres (775 kPa); 324.2 m^3 of water filled the vessel. Its inside diameter is 5.85 m and its length is 14.82 m. The cylindrical section is 8.35 m long. Installed in the center of the north hemispherical end is a 457-mm-diameter pressure-relief device. The disk design rupture pressure is 5 atmospheres for temperatures to 260°C. A catwalk attaches around the vessel on all sides but the north, providing convenient access to the seven viewports, three on the east and four on the west. Above these viewports, four nitrogen pressure cylinders are mounted symmetrically. Each cylinder is 8.534 m long and each has a 0.610-m diameter. Each has a volume of 2.088 m^3 and a design pressure of 122 atmospheres (12.36 MPa). A nitrogen tube trailer shown in the right foreground of Fig. 1 supplies nitrogen gas, beginning at 233 atmospheres (23.61 MPa), to the four pressure cylinders, which normally are charged to 100 atmospheres (10.13 MPa). Just west of the chamber, and behind the tube trailer, the instrument trailer appears. It houses all instruments, data collection devices, and control devices. Facing the instrument trailer, but not visible in Fig. 1, is a walk-in hatch, centered in the west side of the chamber, which provides chamber access.

Nitrogen Pressurization System

Figure 2 is a schematic of the high-pressure piping system typical of each nitrogen pressure cylinder. For convenience, only one pressure cylinder and the north manifold are shown. Both cylinders on the west side connect to the north manifold, while the two cylinders on the east side connect to the south manifold. Flow is controlled from either or both ends of a cylinder to its manifold by a manual valve and an actuated 2-in. (5-cm) valve in series. Four pipes from each manifold extend into the chamber, so that a nozzle exit is located 1.170 m from the top inside surface of the chamber

Manuscript submitted on October 22, 1981.

Fig. 1 — The NRL 324-m^3 fire chamber facility

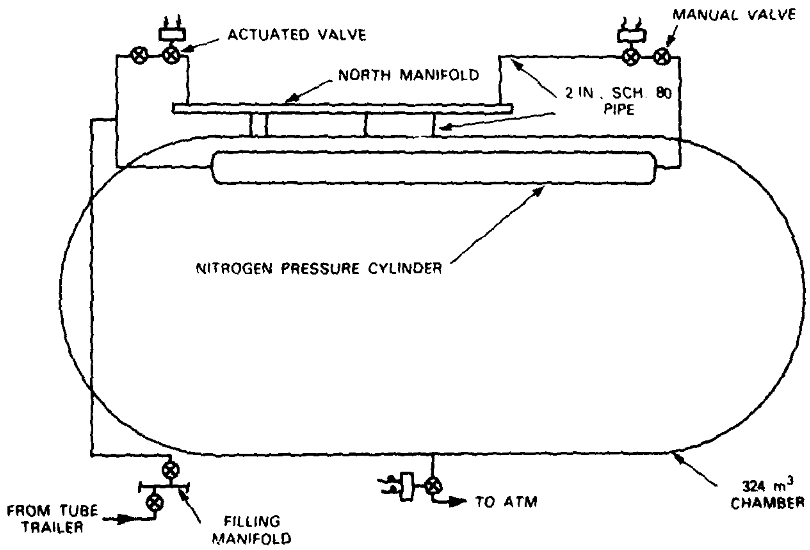

Fig. 2 — Typical high-pressure piping for each of the four nitrogen pressure cylinders

and is directed vertically downward on a line normal to the chamber axis. The four pipes from each manifold are located along the chamber length so that either a three-nozzle or a four-nozzle array (equally spaced) can be selected. Pipe extensions without nozzles are capped. The high-pressure steel pipe is 2-in. (5-cm), schedule 80. Nozzle flow calibration is possible since an ASTM, thin-plate, square-edged orifice [3] connects between the north and south manifold.

Nozzles

Figure 3 shows a nozzle assembly view. Nozzles connect to the 2-in. pipe extensions. The high-density polyethylene liner minimizes heat flow to the nitrogen gas stream and thus maximizes the temperature difference between the injected pressurant gas and the chamber resident gas. In this system flow in each nozzle throat remains critical [4] during chamber pressurization.

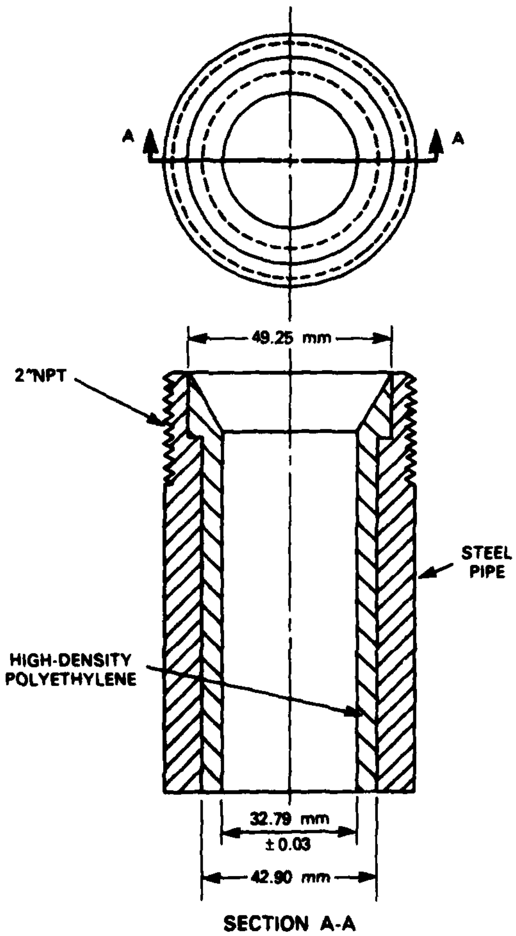

Fig. 3 — Sectional view of nozzle assembly

Thermocouple and Nozzle Locations

In Fig. 4, we show the two positions of the 13-thermocouple array. Position 2 is along the chamber centerline, while position 1 is displaced laterally 0.6 of the distance to the chamber wall and is in the upper northwest quadrant of the chamber. If the $z = 0$ plane bisects the chamber normal to its axis and positive z-values are to the north and negative ones to the south, then the cylindrical r- and θ-coordinates for position 2 are 0.000 m and 0°, respectively; for position 1 they are 2.017 m and 45°, respectively. The z-coordinates for each of the 13 thermocouples remain the same for both positions, i.e., $z = z_I$, where $I = 1, \ldots, 13$, and the 13 z-coordinates are, respectively, −0.586, −0.293, 0.000, 0.293, 0.586, 0.878, 2.049, 2.342, 2.635, 2.928, 3.220, 3.513, and 3.806 m. The thermocouples are bare-wire chromel-alumel, 0.10 mm in diameter, with time constants of less than 0.2 s.

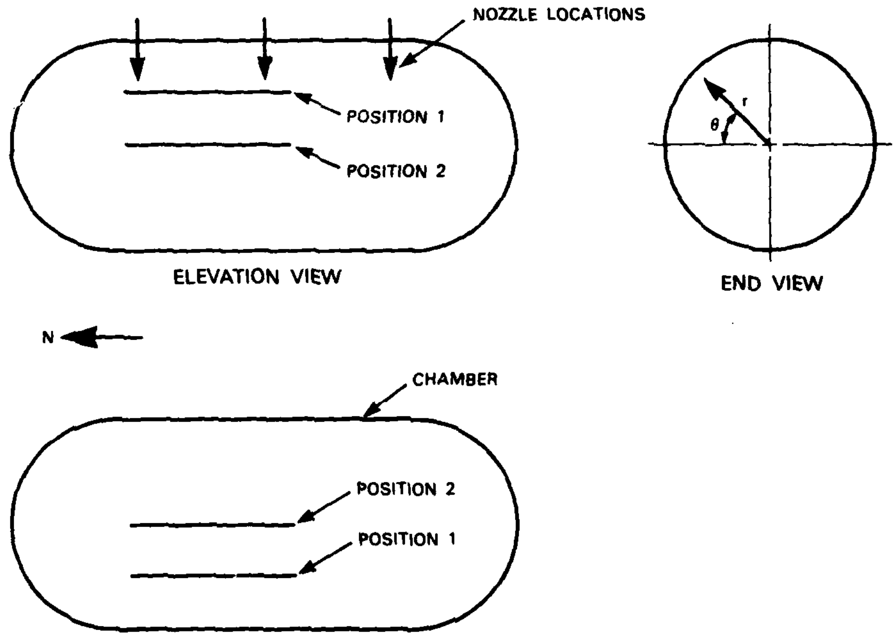

Fig. 4 — Schematic showing the two positions inside the chamber of the 13-thermocouple array; position 1 is off center; position 2 is along the chamber centerline. Three nozzle locations are also shown.

When three nozzles are used, they are located in the three vertical planes $z = +1.216$, 0.0, and −1.216 m, with nozzle exits directed downward normal to the chamber axis and positioned 1.170 m below the top of the chamber wall. The south nozzle is in the plane $z = -1.216$ m.

Flow Obstacle

Figure 5 is a plan-view sketch that shows the location of the flow obstacle in the chamber. The obstacle is a metal cabinet, 1.216 m wide by 1.216 m deep by 2.667 m high, with the top, bottom, and three sides closed. The fourth side is covered with a screen wire that has 15 openings per 25.4 mm with 0.25 mm wire diameter; the screen side is shown in Fig. 5 facing to the west. In the experiments, it also faced to the north. The top of the cabinet extends 0.686 m above the chamber centerline, along which the 13 thermocouples are positioned.

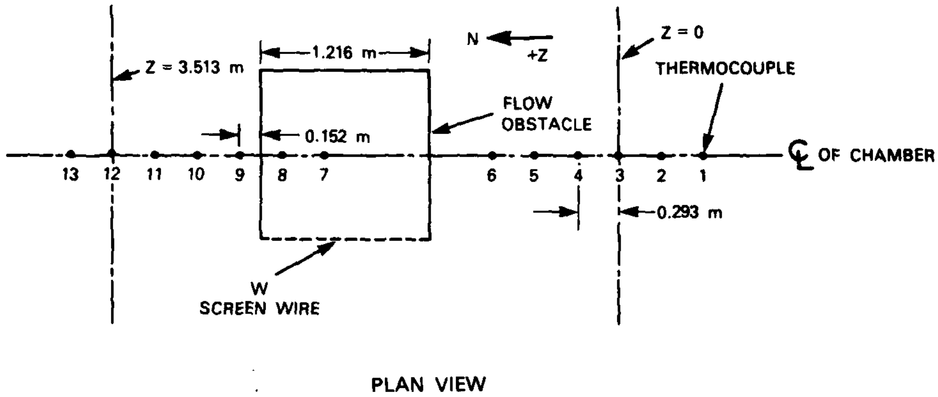

Fig. 5 — Plan-view schematic of chamber interior giving obstacle location and thermocouple I locations for position 2 relative to the vertical plane $z = 0$

EXPERIMENTAL PROCEDURE

The procedure used for experiments without the flow obstacle (uncluttered) and the procedure used with the flow obstacle (cluttered) are described as follows.

Without Flow Obstacle (Uncluttered)

The same procedure was repeated in each of two sets of runs with no flow obstacle. There were seven replicate runs in set 1 and four in set 2 (see Table 1). For set 1, the thermocouple array was in position 1; for set 2, it was in position 2. Three pressure cylinders charged to about 100 atmospheres were used in each set. The two west cylinders fed nitrogen gas to the north manifold, and one east cylinder fed the south manifold. Flow was from both ends of each cylinder. The north manifold fed two nozzles (north and center) while the south fed the third (south). The z-coordinates for the north, center, and south nozzles were 3.513, 0.000, and −3.413 m, respectively.

Table 1 — Description of Experiments

Experimental Set Number	Scaling Run Numbers	Number of Runs	Thermocouple Position Number	Nozzles Used	Clutter Condition	Obstacle Screen Position	Numbers of A- and B-Tables
1	230-236	7	1	3	Unclut.	—	2-8
2	237-240	4	2	3	Unclut.	—	9-12
3	241-244	4	2	1 (South)	Cluttered	West	13-16
4	245-248	4	2	1 (South)	Cluttered	North	17-20

Data collection was started 30 s prior to the start of a run. A run was started by the simultaneous opening of the appropriate six activated valves. Nitrogen gas flowed into the chamber until its pressure increased from 1 to 2 atmospheres, requiring about 12 s. The valves were then closed. Data collection continued for a total of 300 s. Seventeen channels of data were recorded by two data loggers (Doric-Digitrend 200) as follows:

13 channels for the thermocouple array,
2 channels for pressurant gas supply temperatures,

1 channel for chamber pressure, and
1 channel for nitrogen cylinder pressures.

Data loggers scanned each channel twice per second. Loggers were controlled in parallel so that each agreed in time.

With Flow Obstacle (Cluttered)

Two sets (3 and 4), of four replicate runs each, were made with an obstacle (see Table 1). The same procedure was used as described above, with the following exceptions. The thermocouple array was used only in position 1 and only the south nozzle was used. The south manifold was fed nitrogen by three pressure cylinders, the two east cylinders and one west cylinder. The chamber was pressurized to 2 atmospheres in about 30 s. For set 3, the screened side of the obstacle faced west; for set 4, it faced north.

EXPERIMENTAL RESULTS

Detailed data for the four sets of experiments listed in Table 1 are presented in a comprehensive series of five tables, A, B, C, D, and E. The information found in each comprehensive table is described below prior to discussion of the data.

A-Tables

Tables 2A to 20A, called A-tables, present temperature histories at 1-s intervals, as determined by the 13-thermocouple array at each *I*-Location, 1 through 13. Interior chamber coordinates of each *I*-location are given by the subtable located in the upper right-hand corner of the A-tables. In addition, the first four columns in the A-tables, respectively, give:

(1) Time in seconds with $t = 0$ corresponding to the time the activated-valve switch is thrown to open.

(2) Nitrogen pressure cylinder pressures in atmospheres.

(3) Pressurant gas supply temperature at nozzle exit in K.

(4) Chamber pressure in atmospheres.

Each A-table is programmatically produced (see Appendix A) from the two magnetic data tapes obtained during the experimental run. Accordingly, A-tables are produced for all the runs in each set.

Table 2A — Scaling Run 230: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2
-4	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.2	283.2	283.2	284.2	284.2	284.2	284.2	283.2
-3	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2
-2	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2
-1	[illegible]	***	1.002	285.9	284.3	283.9	285.3	285.4	286.4	283.2	283.2	284.2	284.2	284.2	284.2	283.2
0	[illegible]	262.0	1.055	292.9	290.6	289.2	291.2	292.4	293.6	285.7	287.2	288.2	287.2	288.7	287.2	286.7
1	[illegible]	257.6	1.185	290.4	296.3	295.7	297.5	298.5	298.6	291.2	292.2	294.2	293.2	294.2	293.2	293.2
2	70.442	254.3	1.304	301.5	299.5	299.4	300.8	301.5	301.9	296.2	296.2	297.2	296.7	297.7	297.2	297.2
3	64.415	252.2	1.413	303.5	301.3	301.6	302.6	303.1	302.7	299.2	299.2	300.2	300.2	300.2	299.2	299.2
4	[illegible]	250.4	1.509	303.9	302.8	302.4	303.7	304.0	304.1	300.2	300.7	301.7	301.7	302.2	301.2	301.2
5	[illegible]	247.9	1.597	305.1	303.5	303.6	304.5	304.5	304.7	303.2	302.2	303.2	303.2	304.2	303.2	302.2
6	[illegible]	244.3	1.678	305.5	305.0	304.8	305.5	305.4	305.4	303.2	302.2	303.7	303.7	303.7	303.7	303.7
7	46.45	[illegible]	1.733	305.8	304.5	304.7	305.3	305.2	305.4	303.2	303.2	304.2	303.2	303.2	303.2	303.2
8	44.095	239.2	1.798	306.2	304.7	304.5	305.5	305.3	305.5	303.2	302.2	304.2	304.2	304.2	304.2	303.2
9	40.864	236.7	1.863	306.2	304.7	304.3	305.7	305.6	305.5	303.7	302.7	304.2	304.7	304.2	303.7	303.2
10	37.986	232.6	1.922	305.5	304.5	304.5	305.4	304.9	304.9	303.2	302.2	303.2	304.2	304.2	304.2	304.2
11	36.939	196.3	1.966	304.8	303.4	303.7	304.5	304.2	304.4	301.7	301.7	302.7	302.7	303.7	302.7	302.7
12	37.524	164.7	1.976	303.5	301.9	302.1	303.0	302.8	302.8	301.2	301.2	302.2	302.2	302.2	302.2	302.2
13	***	***	1.975	302.5	300.9	300.9	302.1	302.0	302.0	300.7	300.2	302.2	302.2	302.2	302.2	302.2
14	***	***	1.973	302.4	301.0	301.0	302.2	301.7	302.0	300.2	300.2	301.2	302.2	302.2	302.2	302.2
15	***	***	1.971	302.3	300.9	300.8	301.8	301.4	301.6	300.2	300.2	301.2	301.2	302.2	302.2	302.2
16	***	***	1.970	301.7	300.2	300.4	301.4	301.2	301.0	300.2	300.2	301.2	301.2	302.2	302.2	301.2
17	***	***	1.969	301.0	300.0	300.0	301.0	300.8	300.9	300.2	300.2	301.2	301.2	301.2	301.2	301.2
18	***	***	1.967	300.9	299.7	299.9	301.0	300.6	300.1	299.2	299.2	300.2	300.7	301.2	300.7	300.2
19	***	***	1.966	300.2	299.3	299.2	300.2	300.2	299.8	298.2	299.2	300.2	300.2	301.2	300.2	300.2
20	***	***	1.965	299.8	298.8	298.4	299.3	299.6	299.8	299.2	299.2	300.2	300.2	300.2	300.2	299.2
25	***	***	1.960	299.2	298.0	298.2	299.5	300.1	300.0	298.2	297.2	299.2	299.2	300.2	299.2	298.2
30	***	***	1.956	299.1	298.0	298.0	299.0	298.9	299.0	297.2	297.2	298.2	298.2	299.2	299.2	298.2
35	***	***	1.953	298.7	297.5	297.5	298.5	298.5	298.7	297.2	297.2	299.2	299.2	299.2	298.2	298.2
40	***	***	1.950	298.2	297.1	297.2	298.2	298.3	298.5	297.2	297.2	298.2	298.2	299.2	298.2	298.2
45	***	***	1.948	298.1	296.9	297.3	298.2	298.2	298.4	297.2	297.2	298.7	299.2	299.2	298.2	298.2
50	***	***	1.945	297.7	296.8	297.0	298.0	298.1	298.1	297.2	297.2	298.2	298.2	298.2	297.2	297.2
55	***	***	1.943	297.7	296.8	296.5	297.7	297.8	297.9	296.2	296.2	297.2	298.2	298.2	297.2	297.2
60	***	***	1.942	297.8	296.7	296.0	297.3	297.4	297.5	296.2	296.2	297.2	297.2	298.2	296.2	297.2
65	***	***	1.940	297.7	296.4	296.1	296.7	297.2	296.9	296.2	296.2	297.2	297.2	297.2	294.2	297.2
70	***	***	1.938	297.4	296.1	295.4	295.8	296.9	296.9	296.2	296.2	297.2	297.2	296.2	294.2	296.2
80	***	***	1.936	297.3	295.5	295.9	296.0	296.8	296.0	295.2	295.2	296.2	296.2	296.2	294.2	296.2
90	***	***	1.933	296.7	295.2	295.1	296.2	296.2	296.4	295.2	295.2	296.2	296.2	296.2	294.2	295.2
100	***	***	1.931	295.7	294.6	294.5	296.0	296.2	296.3	294.2	294.2	296.2	296.2	295.2	294.2	295.2
110	***	***	1.929	296.0	294.7	294.6	296.0	295.7	296.0	294.2	294.2	295.2	295.2	295.2	294.2	295.2
120	***	***	1.927	295.9	294.6	294.6	295.5	295.5	295.6	294.2	294.2	295.2	295.2	295.2	293.2	294.2
130	***	***	1.925	295.7	294.4	294.5	295.5	295.6	295.5	294.2	294.2	295.2	295.2	294.2	293.2	294.2
140	***	***	1.923	295.4	294.2	294.3	295.2	295.1	295.2	294.2	293.2	294.2	294.7	294.2	293.2	294.2
150	***	***	1.921	295.1	293.9	294.0	295.2	295.0	294.9	294.2	293.2	294.2	294.2	294.2	292.2	294.2
160	***	***	1.920	295.0	293.8	293.9	294.8	294.0	294.8	293.2	293.2	294.2	294.2	294.2	293.2	293.2
170	***	***	1.918	294.8	293.5	293.4	294.2	294.5	294.1	293.2	293.2	294.2	294.2	294.2	293.2	293.2
180	***	***	1.917	294.2	293.1	293.2	294.2	294.2	294.2	293.2	293.2	294.2	294.2	294.2	293.2	293.2
190	***	***	1.915	294.3	292.9	293.2	294.1	294.1	294.1	292.2	292.2	293.2	294.2	293.2	292.2	292.2
200	***	***	1.914	294.1	292.8	292.9	293.9	293.8	293.9	292.2	292.2	293.2	293.2	293.2	292.2	292.2
210	***	***	1.913	293.8	292.8	292.8	293.7	293.8	293.7	292.2	292.2	293.2	293.2	293.2	292.2	292.2

I	COORDINATES R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 3A — Scaling Run 231: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	•••	•••	1.003	286.5	285.6	285.6	286.5	286.4	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2
-4	•••	•••	1.003	286.6	285.6	285.6	286.5	286.5	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2
-3	•••	•••	1.003	286.5	285.6	285.6	286.5	286.5	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2
-2	•••	•••	1.003	286.5	285.6	285.6	286.5	286.5	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2
-1	•••	•••	1.003	286.5	285.6	285.6	286.5	286.5	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2
0	.483	307.1	1.003	287.3	285.9	285.6	286.7	286.9	287.9	286.2	286.2	287.2	287.2	287.2	286.7	286.2
1	.503	261.2	1.065	294.8	292.4	290.7	292.7	293.5	294.4	289.2	290.2	291.2	290.2	291.2	289.2	289.2
2	.497	257.1	1.195	299.5	298.1	297.8	298.8	299.0	298.4	293.7	295.2	296.2	294.7	295.7	294.7	295.2
3	.490	254.2	1.313	302.9	301.5	301.4	302.0	302.5	302.4	298.2	298.2	300.2	299.2	300.2	300.2	300.2
4	.490	251.8	1.418	304.5	303.6	303.2	303.8	304.3	304.8	301.2	301.2	301.7	302.2	302.7	301.7	301.7
5	.483	250.1	1.513	305.9	304.5	303.9	305.2	305.4	305.1	303.2	304.2	304.2	303.2	303.2	303.2	304.2
6	.483	247.4	1.600	306.8	304.7	304.7	305.2	305.4	305.5	304.2	304.2	305.2	305.2	305.7	304.7	305.2
7	.483	244.5	1.681	306.7	304.9	305.1	305.9	305.8	305.3	304.2	304.2	305.2	305.2	305.2	305.2	305.2
8	.480	240.5	1.754	306.3	304.9	305.6	306.4	306.0	305.3	305.2	305.2	306.2	305.7	305.7	305.2	305.7
9	.476	238.3	1.822	306.1	305.2	304.9	305.9	305.8	305.5	306.2	304.2	305.2	305.2	305.2	305.2	306.2
10	.476	235.8	1.884	305.7	304.7	304.7	305.7	306.0	306.2	305.2	304.7	305.2	305.2	304.7	305.2	305.7
11	.429	229.1	1.941	305.9	304.6	304.8	305.1	304.7	304.5	305.2	304.2	305.2	305.2	306.2	304.2	304.2
12	.429	180.2	1.976	303.8	303.5	303.8	304.6	304.4	304.4	304.2	303.7	304.7	304.7	304.7	304.2	304.2
13	.429	163.0	1.982	303.5	302.5	302.5	303.7	303.5	303.2	303.2	303.2	304.2	305.2	305.2	304.2	304.2
14	•••	•••	1.980	303.8	301.8	302.1	303.5	302.9	302.9	303.2	303.2	304.2	304.2	304.2	303.7	303.7
15	•••	•••	1.978	303.2	301.4	301.8	302.8	302.1	301.9	302.2	302.2	304.2	304.2	304.2	304.2	303.2
16	•••	•••	1.977	303.0	301.6	301.6	302.4	302.3	301.7	301.7	302.2	303.2	304.2	304.2	303.7	303.2
17	•••	•••	1.975	302.9	301.7	301.8	302.4	302.4	302.1	302.2	302.2	303.2	304.2	303.2	303.2	302.2
18	•••	•••	1.974	302.2	301.3	301.5	302.6	302.2	302.0	301.2	302.2	302.2	303.2	303.2	303.2	302.2
19	•••	•••	1.973	301.9	301.0	301.5	302.4	302.1	302.1	301.2	301.2	302.2	302.7	303.2	301.7	301.2
20	•••	•••	1.971	301.5	300.6	301.2	302.0	301.9	302.1	301.2	301.2	302.2	302.2	302.2	301.2	301.2
21	•••	•••	1.970	301.2	300.2	300.6	301.5	301.4	301.7	301.2	301.2	302.2	302.2	302.2	301.7	301.2
26	•••	•••	1.966	300.8	299.5	299.3	300.1	300.0	299.9	300.2	300.2	300.2	301.2	301.2	300.2	300.2
31	•••	•••	1.962	299.9	298.9	299.2	300.0	299.9	300.0	300.2	300.2	301.2	301.2	301.2	301.2	301.2
36	•••	•••	1.959	299.9	298.8	298.8	299.7	299.5	299.5	300.2	300.2	301.2	301.2	301.2	300.2	300.2
41	•••	•••	1.956	299.7	298.8	298.9	299.6	299.5	299.5	299.2	299.2	300.2	300.2	300.2	299.2	299.2
46	•••	•••	1.954	299.4	298.4	298.5	299.2	299.5	299.5	298.2	298.2	299.2	299.2	299.2	296.2	299.2
51	•••	•••	1.952	299.3	298.4	298.5	299.1	299.0	299.1	298.2	298.2	299.2	299.2	299.2	299.2	299.2
56	•••	•••	1.950	299.1	298.3	298.1	298.6	298.6	298.9	299.2	299.2	300.2	299.2	299.2	296.2	298.2
61	•••	•••	1.948	298.7	297.7	297.7	298.8	298.8	299.0	298.2	298.2	299.2	299.2	299.2	298.2	298.2
66	•••	•••	1.946	298.6	297.4	297.7	298.5	298.6	298.7	298.2	298.2	299.2	298.2	298.2	296.2	298.2
71	•••	•••	1.945	298.4	297.4	297.5	298.5	298.4	298.3	298.2	297.2	298.2	298.2	297.7	297.2	298.2
81	•••	•••	1.942	298.1	297.3	297.3	298.1	298.1	298.3	297.2	296.7	298.2	298.2	297.2	297.2	298.2
91	•••	•••	1.940	298.0	296.9	297.1	298.0	297.4	297.4	297.2	296.2	297.2	297.2	297.2	295.7	297.7
101	•••	•••	1.938	297.4	296.5	296.6	297.4	297.1	297.1	297.2	296.2	297.7	297.2	297.2	296.2	297.2
111	•••	•••	1.936	296.9	296.2	296.4	297.2	297.2	297.2	297.2	296.2	297.2	297.2	297.2	296.2	297.2
121	•••	•••	1.934	297.1	295.9	295.8	297.0	297.0	297.1	296.2	296.2	297.2	297.2	297.2	296.2	296.2
131	•••	•••	1.932	296.9	295.7	295.5	296.7	296.7	296.9	296.2	296.2	297.2	297.2	297.2	295.2	296.2
141	•••	•••	1.930	296.6	295.5	295.5	296.4	296.0	296.4	296.2	296.2	296.2	297.2	296.2	295.2	296.2
151	•••	•••	1.929	296.4	295.2	295.4	296.2	295.9	295.9	296.2	296.2	296.2	297.2	296.2	294.2	296.2
161	•••	•••	1.927	295.9	295.0	295.2	296.0	296.0	296.1	296.2	296.2	296.2	296.2	296.2	294.2	295.2
171	•••	•••	1.926	296.0	294.6	294.8	296.0	295.9	295.8	296.2	295.2	296.2	296.2	296.2	294.2	295.2
181	•••	•••	1.924	295.9	294.5	294.5	295.9	295.8	295.9	295.2	295.2	296.2	296.2	295.2	295.2	295.2
191	•••	•••	1.923	295.7	294.5	294.5	295.2	295.1	295.7	295.2	295.2	296.2	296.2	296.2	294.2	295.2
201	•••	•••	1.922	295.4	294.3	294.3	295.1	295.0	295.2	295.2	295.2	296.2	296.2	295.2	293.2	294.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 4A — Scaling Run 232: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	•••	•••	1.005	281.6	280.7	280.6	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-4	•••	•••	1.005	281.6	280.7	280.6	281.6	281.5	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-3	•••	•••	1.005	281.6	280.7	280.7	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-2	•••	•••	1.005	281.5	280.7	280.7	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-1	•••	•••	1.005	281.5	280.7	280.6	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2
	097.061	279.6	1.046	282.7	281.4	280.9	282.1	282.4	283.3	281.2	281.2	282.2	282.2	282.2	282.2	281.2
	183.895	256.9	1.096	289.9	287.6	285.6	287.5	289.4	290.1	285.2	286.2	287.7	286.7	287.2	285.7	285.7
	276.365	252.1	1.227	295.3	293.6	292.5	294.0	294.9	294.9	291.2	291.2	292.2	291.2	292.2	292.2	292.2
	371.952	248.4	1.307	298.4	297.3	296.7	297.1	297.9	297.7	294.2	295.2	296.2	294.2	295.2	294.2	294.2
	465.932	246.2	1.415	299.8	298.5	298.0	298.9	299.3	299.2	295.7	296.2	297.2	296.2	297.2	296.7	296.7
	560.497	244.0	1.516	300.7	299.4	299.8	300.4	300.8	300.9	298.2	298.2	299.2	298.2	299.2	298.2	298.2
	655.755	241.3	1.604	300.9	300.1	300.0	300.8	300.8	301.0	299.7	298.7	299.7	299.7	299.2	299.2	299.7
	751.442	238.3	1.687	300.8	300.0	300.2	301.0	301.5	301.2	300.2	300.2	301.2	300.2	300.2	300.2	300.2
	847.602	236.7	1.762	301.4	300.0	300.6	301.3	301.7	300.9	300.2	299.7	299.7	299.7	299.7	299.2	300.2
	944.177	234.2	1.831	301.8	300.7	300.7	301.7	301.9	301.7	301.2	300.2	301.2	300.2	300.2	298.2	300.2
	1040.973	231.3	1.894	301.3	300.4	301.1	302.0	301.6	300.2	299.7	298.7	300.7	300.7	300.7	300.2	300.7
	1138.776	219.3	1.952	301.1	300.0	300.6	300.8	300.3	300.0	299.2	298.2	299.2	300.2	300.2	300.2	300.2
	1239.265	172.3	1.974	299.9	299.5	300.0	300.5	299.9	299.5	299.2	298.2	298.2	298.2	299.2	299.2	299.2
	1339.806	169.8	1.979	299.4	298.0	298.6	298.9	298.7	298.7	298.2	298.2	299.2	298.7	299.2	299.2	298.2
14	•••	•••	1.978	298.6	297.4	297.5	298.0	297.6	298.0	298.2	297.2	298.2	299.2	299.2	299.2	299.2
15	•••	•••	1.976	298.0	296.8	296.7	297.9	297.5	297.8	297.7	297.2	298.2	297.2	297.7	298.2	297.7
16	•••	•••	1.975	297.6	296.9	296.7	297.6	297.1	297.0	297.2	297.2	298.2	297.2	298.2	297.2	297.2
17	•••	•••	1.973	296.7	295.7	296.3	296.8	296.4	296.8	297.2	297.2	298.2	298.2	298.2	298.2	296.7
18	•••	•••	1.972	296.9	295.5	295.5	296.8	296.7	296.8	297.2	297.2	298.2	298.2	297.2	297.2	296.2
19	•••	•••	1.970	297.2	295.6	295.7	296.8	296.6	296.7	296.7	296.7	297.7	297.2	298.2	297.2	297.2
20	•••	•••	1.969	297.2	296.0	295.8	296.8	296.6	296.5	296.2	296.2	297.2	297.2	297.2	297.2	296.2
21	•••	•••	1.968	296.5	295.5	295.7	296.4	295.9	295.9	295.2	296.2	297.2	297.2	297.2	297.2	296.2
26	•••	•••	1.963	296.4	295.4	295.5	296.0	295.5	295.8	295.7	295.7	296.7	296.7	297.2	296.2	296.2
31	•••	•••	1.959	295.7	295.0	294.5	295.2	295.1	295.1	295.2	295.2	296.2	296.2	296.2	296.2	296.2
36	•••	•••	1.956	295.2	294.3	294.0	295.0	295.0	295.2	295.2	295.2	296.2	296.2	295.2	295.2	295.2
41	•••	•••	1.954	295.3	294.0	293.8	294.2	294.0	294.1	294.2	294.2	295.2	295.2	295.2	295.2	295.2
46	•••	•••	1.951	294.2	293.2	293.1	293.8	293.7	293.6	294.2	294.2	295.2	295.2	295.2	294.2	294.2
51	•••	•••	1.949	293.8	292.9	292.9	293.8	293.7	293.8	293.2	293.2	294.2	294.2	294.2	293.2	293.2
56	•••	•••	1.946	293.6	292.4	292.8	293.7	293.7	293.5	293.2	293.2	294.2	294.2	294.2	293.2	293.7
61	•••	•••	1.944	293.5	292.4	292.6	293.4	293.2	293.2	293.2	293.2	294.2	294.2	294.2	293.2	293.2
66	•••	•••	1.942	293.2	292.3	292.4	293.2	293.3	293.3	292.2	293.2	294.2	294.2	294.2	293.2	293.2
71	•••	•••	1.941	293.2	292.0	292.0	292.7	292.9	293.0	292.2	292.2	294.2	294.2	293.2	292.2	292.2
81	•••	•••	1.938	293.0	291.8	290.9	292.7	292.8	292.6	292.2	292.2	293.2	292.2	293.2	292.2	292.2
91	•••	•••	1.935	292.8	291.3	291.0	292.2	292.2	292.5	292.2	292.2	292.2	292.2	292.2	292.2	292.2
101	•••	•••	1.932	292.4	291.2	291.3	292.0	291.8	291.8	291.2	291.2	292.2	292.2	292.2	291.2	291.2
111	•••	•••	1.930	291.7	290.8	290.8	291.5	291.5	291.5	291.2	291.2	292.2	292.2	292.2	291.2	291.2
121	•••	•••	1.927	291.7	290.8	290.7	291.6	291.5	291.6	291.2	291.2	292.2	292.2	291.2	291.2	291.2
131	•••	•••	1.925	291.5	290.4	290.4	291.3	291.2	291.3	291.2	291.2	292.2	292.2	291.2	290.2	290.2
141	•••	•••	1.923	290.9	289.9	289.7	291.0	291.0	291.0	290.2	290.2	291.2	291.2	291.2	289.2	290.2
151	•••	•••	1.921	290.5	289.5	289.6	290.5	290.5	290.3	290.2	290.2	291.2	291.2	291.2	290.2	290.2
161	•••	•••	1.920	290.4	289.5	289.6	290.5	290.3	290.2	290.2	290.2	290.2	291.2	290.2	290.2	290.2
171	•••	•••	1.918	290.0	289.1	289.2	289.6	290.1	290.1	289.2	289.2	290.2	290.2	290.2	289.2	289.2
181	•••	•••	1.917	289.9	289.1	289.2	289.9	289.8	289.9	289.2	289.2	290.2	290.2	290.2	289.2	289.2
191	•••	•••	1.915	289.7	288.8	288.9	289.6	289.6	289.7	289.2	289.2	290.2	290.2	290.2	289.2	289.2
201	•••	•••	1.914	289.5	288.6	288.5	289.2	288.9	289.1	289.2	288.2	289.2	289.2	290.2	289.2	289.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 5A — Scaling Run 233: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	•••	•••	1.000	285.6	284.5	284.5	285.5	285.4	285.4	285.2	285.2	286.2	286.2	286.2	285.2	285.2
-4	•••	•••	1.000	285.6	284.5	284.4	285.5	285.4	285.4	285.2	285.2	286.2	286.2	286.2	285.2	285.2
-3	•••	•••	1.000	285.6	284.5	284.4	285.5	285.4	285.4	285.2	285.2	286.2	286.2	286.2	285.2	285.2
-2	•••	•••	1.000	285.6	284.5	284.5	285.5	285.4	285.5	285.2	285.2	286.2	286.2	286.2	285.2	285.2
-1	•••	•••	1.000	285.6	284.5	284.5	285.5	285.4	285.4	285.2	285.2	286.2	286.2	286.2	285.2	285.2
0	.483	305.1	1.000	286.7	285.8	284.5	285.9	286.4	287.9	285.2	285.2	286.2	286.2	286.2	285.2	285.2
1	.497	262.4	1.060	292.6	290.0	287.9	289.6	291.2	292.4	287.2	288.2	290.2	289.2	289.2	288.2	288.2
2	.497	256.5	1.195	298.0	296.0	294.9	296.1	296.9	296.9	292.7	294.2	295.2	294.2	295.7	294.2	294.2
3	.490	254.1	1.312	301.2	299.6	298.7	299.7	300.5	299.9	296.2	297.2	298.2	297.2	298.2	297.2	297.2
4	.486	250.8	1.416	303.1	301.5	301.2	302.4	303.0	303.0	299.7	299.7	301.2	300.2	300.7	299.7	299.7
5	.483	247.7	1.511	304.5	303.0	302.3	303.8	303.9	304.1	302.2	302.2	302.2	302.2	302.2	301.2	302.2
6	.483	244.7	1.597	304.5	303.3	303.5	304.2	304.5	304.8	303.7	303.2	304.2	303.7	304.2	303.2	303.2
7	.476	243.3	1.676	305.4	303.8	303.8	304.2	304.6	305.3	304.2	304.2	305.2	304.2	304.2	302.2	303.2
8	.476	240.7	1.740	305.2	303.9	303.8	304.9	305.0	305.6	304.2	304.2	305.2	304.7	304.7	304.2	304.7
9	.476	237.9	1.815	305.4	303.6	304.0	304.6	304.7	305.2	304.2	303.2	304.2	304.2	304.2	304.2	304.2
10	.476	235.4	1.877	305.5	303.7	303.9	304.6	304.5	305.2	303.7	303.2	304.2	304.2	304.2	303.7	304.2
11	.429	231.7	1.934	304.3	302.7	303.4	304.2	304.7	304.6	303.2	303.2	304.2	304.2	304.2	304.2	304.2
12	.429	186.5	1.972	302.7	301.7	302.1	303.3	303.5	303.5	302.7	302.2	303.2	303.2	303.7	302.7	303.7
13	.429	169.7	1.979	302.8	301.5	301.9	302.8	302.5	302.5	302.2	302.2	303.2	303.2	303.2	302.2	303.2
14	•••	•••	1.978	302.8	301.6	301.8	302.4	302.0	302.0	302.2	302.2	303.2	302.7	303.2	302.2	302.2
15	•••	•••	1.976	302.3	301.2	301.2	302.2	301.9	301.8	302.2	301.2	302.2	302.2	302.2	302.2	302.2
16	•••	•••	1.974	301.7	300.4	300.5	301.4	300.8	300.7	300.7	300.7	302.2	302.2	302.2	302.2	301.7
17	•••	•••	1.973	301.0	299.6	299.5	300.8	300.4	300.6	300.2	300.2	302.2	302.2	302.2	302.2	302.2
18	•••	•••	1.971	300.5	299.3	299.2	300.0	299.5	300.0	300.2	300.2	302.2	302.2	302.2	302.2	301.2
19	•••	•••	1.970	300.1	298.7	299.0	300.2	300.2	300.3	300.2	300.2	302.2	301.2	302.2	302.2	301.2
20	•••	•••	1.969	300.0	299.3	299.3	300.3	300.2	299.6	300.2	300.2	301.2	301.2	302.2	301.2	300.7
21	•••	•••	1.968	300.6	299.5	299.5	300.3	299.9	299.8	300.2	300.2	301.2	301.2	301.2	301.2	300.2
26	•••	•••	1.963	299.7	298.6	298.7	300.0	300.0	300.0	299.2	300.2	301.2	301.2	301.2	300.2	300.2
31	•••	•••	1.960	299.0	298.1	298.3	299.5	299.3	299.3	298.7	299.2	300.2	300.2	299.7	299.2	298.2
36	•••	•••	1.956	298.5	297.8	297.9	298.9	299.0	299.1	298.2	298.2	299.2	300.2	300.2	299.2	298.2
41	•••	•••	1.954	298.5	297.2	297.5	298.5	298.5	298.6	298.2	298.2	299.2	299.2	299.2	298.2	298.7
46	•••	•••	1.951	298.5	297.4	297.5	298.5	298.4	298.3	297.2	297.2	299.2	299.2	299.2	298.2	298.2
51	•••	•••	1.949	298.2	297.2	297.3	298.1	298.0	297.7	297.2	297.2	298.7	299.2	299.2	298.2	298.2
56	•••	•••	1.947	297.9	296.7	296.8	297.7	297.8	298.0	297.2	297.2	298.2	298.2	298.2	296.2	298.2
61	•••	•••	1.945	297.8	296.5	296.7	297.5	297.8	297.8	297.2	297.2	298.2	298.2	298.2	295.7	297.2
66	•••	•••	1.944	298.0	296.4	296.4	297.3	297.3	297.5	297.2	297.2	298.2	298.2	297.2	295.2	297.2
71	•••	•••	1.942	297.8	296.6	296.7	297.0	297.2	297.4	297.2	297.2	298.2	298.2	297.2	295.2	297.2
81	•••	•••	1.940	297.4	296.2	296.2	297.4	297.2	297.2	297.2	296.2	297.2	297.2	297.2	294.2	296.2
91	•••	•••	1.937	296.8	295.9	296.0	297.1	297.1	296.9	296.2	296.2	297.2	297.2	296.2	295.2	296.2
101	•••	•••	1.935	296.3	295.2	295.6	296.7	296.7	296.5	296.2	295.2	297.2	296.2	296.2	294.2	296.2
111	•••	•••	1.933	296.4	294.9	294.5	295.6	295.8	295.9	296.2	295.2	297.2	296.2	296.2	295.2	295.2
121	•••	•••	1.931	296.1	294.9	294.8	295.8	296.0	295.8	295.2	295.2	296.2	296.2	296.2	295.2	295.2
131	•••	•••	1.929	296.3	295.0	295.0	295.7	295.6	295.7	295.2	295.2	296.2	296.2	296.2	295.2	295.2
141	•••	•••	1.927	295.9	294.7	294.6	295.3	295.5	295.5	295.2	295.2	296.2	296.2	296.2	295.2	295.2
151	•••	•••	1.926	295.8	294.5	294.5	294.8	295.2	295.2	295.2	295.2	296.2	296.2	296.2	295.2	295.2
161	•••	•••	1.924	295.4	294.3	294.3	295.1	295.0	294.8	295.2	295.2	296.2	296.2	296.2	295.2	295.2
171	•••	•••	1.923	295.1	293.5	294.2	295.0	295.0	294.7	295.2	294.2	295.2	295.2	295.2	294.2	294.2
181	•••	•••	1.921	294.7	293.6	293.8	295.0	295.0	294.6	294.2	294.2	295.2	295.2	295.2	294.2	294.2
191	•••	•••	1.920	294.6	293.4	293.0	294.5	294.7	294.5	294.2	294.2	295.2	295.2	295.2	293.2	294.2
201	•••	•••	1.919	294.5	293.1	293.1	294.2	294.4	294.5	294.2	293.2	295.2	295.2	295.2	293.2	293.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 6A — Scaling Run 234: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	•••	•••	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-4	•••	•••	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-3	•••	•••	1.001	281.9	280.9	280.9	281.8	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-2	•••	•••	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-1	•••	•••	1.001	282.0	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2
094.456		277.9	1.001	283.4	281.9	281.2	282.7	293.3	283.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2
102.014		256.8	1.089	289.5	288.1	286.8	288.1	289.3	290.7	285.2	286.7	287.2	286.2	287.2	286.2	285.7
274.735		252.8	1.219	295.5	293.6	292.7	294.2	295.0	295.2	290.2	290.2	292.2	291.2	292.2	292.2	292.2
370.367		249.7	1.299	298.6	297.1	296.6	297.3	297.7	298.0	293.2	293.2	294.2	294.2	295.2	295.2	295.2
464.480		247.2	1.405	300.1	298.7	298.5	299.5	299.8	299.6	296.7	296.2	296.7	296.7	297.2	296.7	296.2
559.143		244.1	1.503	300.8	299.7	299.7	300.6	300.8	300.6	298.2	297.2	299.2	298.2	299.2	298.2	298.2
654.480		242.1	1.593	301.7	300.3	300.2	301.5	301.8	301.7	299.2	298.2	300.2	299.7	300.2	299.2	299.2
750.293		239.4	1.673	302.2	300.5	301.0	302.0	302.0	301.5	300.2	300.2	300.2	300.2	301.2	300.2	300.2
846.612		236.2	1.747	301.3	300.0	300.8	301.5	301.4	301.7	300.2	300.2	301.2	301.2	301.2	301.7	302.2
943.238		234.1	1.817	301.7	300.1	300.3	301.3	301.7	301.8	301.2	301.2	302.2	302.2	302.2	301.2	302.2
1040.201		232.4	1.879	301.0	299.8	300.2	301.4	302.0	301.6	300.7	300.2	301.2	301.2	301.2	300.7	301.7
1137.673		219.6	1.937	301.2	299.8	299.9	301.0	300.9	300.7	300.2	300.2	301.2	301.2	301.2	300.2	301.2
1238.476		171.2	1.966	300.3	299.5	299.5	300.4	300.2	300.0	300.2	300.2	301.2	301.2	301.2	300.2	301.2
1338.537		163.7	1.974	299.3	298.7	299.0	299.5	299.0	298.8	299.7	299.2	300.2	300.2	300.2	299.7	299.7
14	•••	•••	1.974	298.5	297.7	297.8	298.5	298.8	298.9	299.2	299.2	300.2	299.2	300.2	299.2	299.2
15	•••	•••	1.972	298.1	296.9	296.7	296.8	297.5	298.7	298.2	298.7	299.7	299.7	299.7	299.2	299.2
16	•••	•••	1.971	297.8	296.9	296.5	297.6	297.7	298.0	297.2	298.2	298.2	298.2	298.2	298.2	298.2
17	•••	•••	1.969	297.0	296.1	296.2	296.9	297.5	297.8	297.2	297.2	298.2	298.2	298.2	298.2	297.2
18	•••	•••	1.968	296.7	295.5	295.7	296.5	296.9	297.2	297.2	297.2	298.2	298.2	298.2	298.2	298.2
19	•••	•••	1.966	296.9	295.8	295.5	296.2	296.3	296.8	297.7	297.2	298.2	298.2	298.2	297.7	297.2
20	•••	•••	1.965	297.3	296.2	295.5	296.7	296.7	296.8	297.2	297.2	297.2	297.2	297.2	297.2	296.2
21	•••	•••	1.965	297.0	296.0	296.0	296.8	296.5	296.6	297.2	296.2	297.2	297.2	297.2	296.2	296.2
26	•••	•••	1.960	295.7	295.1	295.3	296.5	296.7	296.7	296.2	296.2	297.2	297.2	297.2	296.2	296.2
31	•••	•••	1.956	295.9	295.0	295.0	296.2	296.2	296.4	296.2	296.2	297.2	297.2	297.2	296.2	295.7
36	•••	•••	1.953	295.9	294.6	295.1	296.0	295.7	295.9	295.2	295.2	296.2	296.2	296.2	295.2	295.2
41	•••	•••	1.951	295.6	294.0	294.1	295.2	295.2	295.9	295.2	295.2	296.2	296.2	296.2	295.2	294.2
46	•••	•••	1.949	295.0	294.5	294.7	295.2	295.0	295.2	295.2	295.2	296.2	296.2	296.2	295.2	294.2
51	•••	•••	1.947	295.0	294.1	294.2	294.7	294.5	294.9	295.2	295.2	295.7	296.2	296.2	295.2	294.2
56	•••	•••	1.945	294.6	293.3	293.5	294.5	294.5	294.7	295.2	294.2	295.2	295.2	295.2	295.2	294.2
61	•••	•••	1.943	294.4	293.1	292.7	293.3	293.4	294.3	294.2	294.2	295.2	295.2	295.2	294.2	294.2
66	•••	•••	1.941	294.2	292.6	292.2	293.1	293.2	293.8	294.2	293.2	294.2	294.2	295.2	293.2	294.2
71	•••	•••	1.940	294.1	291.9	291.7	292.6	292.8	293.8	293.2	292.2	294.2	294.2	294.2	293.2	293.2
81	•••	•••	1.937	293.5	291.7	291.7	292.7	292.9	293.1	293.2	292.2	293.2	293.2	293.7	292.2	293.2
91	•••	•••	1.935	293.1	291.7	291.9	292.4	292.7	292.9	292.2	292.2	293.2	293.2	293.2	291.2	292.2
101	•••	•••	1.932	293.0	291.8	291.8	292.7	292.7	292.8	292.2	292.2	293.2	293.2	293.2	292.2	292.2
111	•••	•••	1.930	292.8	291.9	292.0	292.8	292.9	292.9	292.2	292.2	293.2	293.2	292.2	291.2	292.2
121	•••	•••	1.928	292.6	291.6	291.7	292.6	292.7	292.7	292.2	291.2	292.2	292.2	292.2	291.2	292.2
131	•••	•••	1.926	292.4	291.3	291.2	292.2	292.2	292.4	292.2	291.2	292.2	292.2	292.2	290.2	291.2
141	•••	•••	1.925	292.3	291.1	290.9	291.3	291.8	291.9	291.2	291.2	292.2	292.2	291.2	289.2	291.2
151	•••	•••	1.923	292.1	291.0	291.0	291.6	291.6	291.7	291.2	291.2	292.2	292.2	291.2	289.2	291.2
161	•••	•••	1.921	291.9	290.9	290.9	291.6	291.7	291.6	291.2	290.2	292.2	292.2	291.2	290.2	291.2
171	•••	•••	1.920	291.5	290.4	290.5	291.0	291.2	291.4	290.7	290.2	291.2	291.2	291.2	290.2	290.2
181	•••	•••	1.918	291.3	290.1	289.9	290.7	290.9	291.0	290.2	290.2	291.2	291.2	291.2	290.2	290.2
191	•••	•••	1.917	290.8	289.7	289.6	290.4	290.4	290.8	290.2	290.2	291.2	291.2	291.2	289.2	290.2
201	•••	•••	1.916	290.7	289.4	289.4	290.3	290.1	290.2	290.2	290.2	291.2	291.2	291.2	289.2	290.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 7A — Scaling Run 235: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	•••	•••	1.001	283.9	283.0	282.9	283.8	283.8	283.9	283.2	283.2	283.2	283.2	283.2	283.2	283.2
-4	•••	•••	1.001	283.9	283.0	282.9	283.8	283.8	283.9	283.2	283.2	283.2	283.2	283.2	283.2	283.2
-3	•••	•••	1.001	283.9	283.0	282.9	283.8	283.8	283.9	283.2	283.2	283.2	283.2	283.2	283.2	283.2
-2	•••	•••	1.001	283.9	283.0	282.9	283.8	283.8	283.9	283.2	283.2	283.2	283.2	283.2	283.2	283.2
-1	•••	•••	1.001	283.9	283.0	282.9	283.8	283.8	283.9	283.2	283.2	283.7	283.2	283.2	283.2	283.2
0	94.653	300.8	1.001	284.5	283.3	282.9	283.9	284.3	285.0	283.2	283.2	284.2	283.2	283.2	283.2	283.2
1	83.367	261.2	1.072	291.8	289.5	288.0	289.7	290.7	291.8	286.2	288.2	288.2	287.2	288.7	286.7	287.2
2	76.313	256.3	1.202	297.1	295.6	295.2	296.1	296.9	297.1	293.2	292.2	293.2	293.2	295.2	293.2	292.2
3	69.867	254.9	1.318	300.2	299.2	298.8	299.4	299.8	299.4	295.2	295.7	296.2	296.2	297.2	296.7	295.7
4	63.959	253.8	1.424	302.2	300.8	300.6	301.6	302.1	301.8	297.2	298.2	299.2	298.2	299.2	298.2	297.2
5	58.772	248.5	1.519	303.1	301.9	301.8	302.5	302.8	303.0	300.7	301.2	302.2	301.2	301.7	300.2	300.7
6	54.461	245.7	1.606	304.0	303.1	301.9	302.6	302.7	302.4	302.2	302.2	302.2	302.2	302.2	302.2	302.2
7	51.306	243.1	1.659	303.4	302.4	302.4	303.1	303.5	303.3	302.2	302.2	302.2	302.2	302.2	301.2	302.2
8	47.486	240.2	1.733	304.5	302.7	302.9	303.8	303.7	303.5	302.2	301.7	302.2	302.2	303.2	302.2	303.2
9	43.980	237.1	1.802	304.0	302.7	302.6	303.8	303.6	303.8	301.2	301.2	302.2	302.2	303.2	303.2	303.2
10	40.095	235.2	1.865	304.4	303.1	302.7	303.8	303.5	303.3	301.7	301.7	302.2	302.2	302.2	301.7	302.2
11	38.020	231.5	1.923	303.4	302.2	303.1	303.6	303.3	302.7	303.2	301.2	302.2	302.2	302.2	301.2	302.2
12	37.160	182.8	1.964	302.5	301.3	301.7	302.2	302.0	301.9	300.7	300.7	301.7	301.7	301.7	300.7	300.7
13	37.680	164.5	1.974	301.5	300.2	300.9	301.8	301.6	300.7	300.2	300.2	301.2	301.2	301.2	301.2	300.2
14	•••	•••	1.973	301.4	300.1	300.3	301.2	301.0	300.9	300.2	300.2	301.2	301.2	301.2	301.2	300.7
15	•••	•••	1.971	301.2	300.0	299.0	300.4	299.9	300.0	300.2	300.2	300.2	301.2	301.2	300.2	300.2
16	•••	•••	1.970	299.7	298.9	298.6	299.5	299.0	299.3	299.2	299.2	300.2	300.2	301.2	300.2	300.2
17	•••	•••	1.968	299.0	297.7	297.7	298.6	298.7	299.2	299.2	299.2	300.2	300.2	300.7	300.2	299.7
18	•••	•••	1.967	298.7	297.8	297.7	299.1	299.1	299.5	299.2	299.2	300.2	300.2	300.2	299.2	299.2
19	•••	•••	1.966	298.6	297.8	298.0	299.1	299.5	299.5	299.2	299.2	300.2	300.2	300.2	299.2	299.2
20	•••	•••	1.964	298.6	297.5	297.7	299.0	299.5	299.5	299.2	299.2	300.2	300.2	300.2	299.2	298.2
21	•••	•••	1.963	298.2	297.4	298.1	299.1	299.4	299.3	299.2	299.2	299.7	299.2	299.7	299.2	298.2
26	•••	•••	1.959	299.0	297.9	297.9	298.4	298.5	298.5	298.2	297.2	298.2	298.2	298.2	297.7	297.2
31	•••	•••	1.955	298.5	297.3	296.8	297.4	297.0	297.1	297.2	297.2	298.2	298.2	298.2	297.2	297.2
36	•••	•••	1.952	298.0	296.8	296.2	296.9	296.8	297.0	297.2	297.2	297.2	297.2	297.2	297.2	296.2
41	•••	•••	1.949	297.0	296.0	295.9	296.8	296.7	297.1	296.2	297.2	297.2	297.2	297.2	297.2	296.2
46	•••	•••	1.947	296.8	295.9	296.0	296.7	296.7	296.7	296.2	296.2	297.2	297.2	297.2	296.2	296.2
51	•••	•••	1.945	296.8	295.8	295.9	296.6	296.5	296.7	296.2	296.2	297.2	297.2	297.2	294.7	296.2
56	•••	•••	1.943	296.3	295.5	295.5	296.5	296.2	295.7	295.2	295.2	296.2	296.2	296.2	294.2	296.2
61	•••	•••	1.941	296.3	295.2	295.2	296.2	296.2	295.7	295.2	295.2	296.2	296.2	296.2	294.2	295.2
66	•••	•••	1.940	296.5	295.2	295.2	296.0	295.8	295.7	295.2	294.2	296.2	295.2	295.2	293.2	295.2
71	•••	•••	1.938	296.0	295.2	295.2	295.8	294.9	295.0	294.2	294.2	295.2	295.2	295.2	293.2	295.2
81	•••	•••	1.936	295.7	294.8	293.7	294.6	294.5	294.8	294.2	294.2	296.2	295.2	295.2	293.2	295.2
91	•••	•••	1.933	295.2	293.8	293.4	294.5	293.9	294.0	294.2	294.2	295.2	295.2	295.2	292.2	294.2
101	•••	•••	1.931	294.9	293.6	293.5	294.2	294.3	294.5	294.2	294.2	295.2	295.2	295.2	294.2	294.2
111	•••	•••	1.929	294.8	293.6	293.7	294.0	294.4	294.8	294.2	294.2	294.2	294.2	294.2	293.2	294.2
121	•••	•••	1.927	294.6	293.7	293.5	293.9	293.8	294.1	293.2	292.2	294.2	294.2	294.2	292.7	293.2
131	•••	•••	1.925	294.5	293.3	293.2	293.9	293.8	294.1	293.2	293.2	294.2	294.2	294.2	292.2	293.2
141	•••	•••	1.924	293.8	293.2	293.3	294.1	294.1	293.9	293.2	293.2	294.2	294.2	293.2	292.2	293.2
151	•••	•••	1.922	293.8	292.9	293.2	294.0	293.9	293.9	293.2	293.2	294.2	294.2	293.2	292.2	293.2
161	•••	•••	1.921	293.6	292.6	292.6	293.1	293.7	293.8	293.2	292.2	293.2	293.2	293.2	292.2	293.2
171	•••	•••	1.919	293.4	292.2	291.9	293.1	293.1	293.3	292.2	292.2	293.2	293.2	293.2	292.2	292.2
181	•••	•••	1.918	293.2	292.4	292.4	293.1	293.3	293.3	292.2	292.2	293.2	293.2	292.2	291.2	292.2
191	•••	•••	1.917	293.1	291.7	291.7	292.9	292.8	292.6	292.2	292.2	292.2	293.2	292.2	291.2	292.2
201	•••	•••	1.915	292.9	291.4	291.7	292.6	292.4	292.4	292.2	292.2	292.2	292.2	292.2	291.2	292.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 8A — Scaling Run 236: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	***	***	.999	290.1	288.8	288.8	289.8	289.8	289.8	289.2	288.7	290.2	290.2	289.2	289.2	289.2
-4	***	***	.999	290.1	288.8	288.8	289.8	289.8	289.9	289.2	289.2	290.2	290.2	289.2	289.2	289.2
-3	***	***	.999	290.0	288.9	288.8	289.8	289.8	289.9	289.2	288.2	290.2	290.2	289.2	289.2	289.2
-2	***	***	.999	290.0	288.9	288.8	289.8	289.8	289.9	289.2	289.2	290.2	290.2	289.2	289.2	289.2
-1	***	***	.999	290.1	288.9	288.8	289.8	289.8	289.9	289.2	289.2	290.2	290.2	289.2	289.2	289.2
	093.816	286.3	.999	292.8	291.2	290.0	291.7	292.2	293.0	289.2	289.2	290.2	290.2	290.2	289.2	289.2
	177.442	266.8	1.086	300.4	298.2	296.2	298.2	299.5	300.3	293.2	294.2	294.7	294.2	295.2	293.7	293.7
	272.673	265.1	1.219	303.9	302.4	301.3	302.6	302.7	302.9	299.2	299.2	301.2	300.2	301.2	300.2	299.2
	366.622	261.7	1.334	307.2	305.2	305.1	305.8	306.3	306.6	302.2	301.7	303.7	303.7	304.7	303.7	303.7
	461.279	259.8	1.441	309.7	307.6	307.9	308.7	308.5	308.4	306.2	306.2	307.2	306.2	307.2	306.2	306.2
	558.027	257.2	1.506	310.3	308.9	308.9	309.7	309.6	309.5	308.2	306.2	303.2	308.2	308.2	308.2	307.2
	653.524	253.2	1.594	311.3	309.6	308.8	310.0	310.1	310.0	307.2	307.7	308.2	308.7	308.7	308.7	308.2
	749.517	249.5	1.675	311.3	309.8	309.8	310.5	310.0	310.5	308.2	308.2	310.2	309.2	310.2	309.2	309.2
	845.905	247.1	1.749	310.2	310.0	310.1	311.1	311.3	311.0	309.2	308.2	308.7	308.7	308.7	308.7	309.2
	942.592	244.4	1.818	311.0	309.5	309.6	310.4	310.3	309.4	309.2	308.2	310.2	309.2	309.2	309.2	309.2
	1039.646	241.7	1.881	310.5	309.3	309.9	310.5	310.0	310.2	308.7	308.7	309.7	310.2	310.2	309.7	309.7
	1137.857	236.8	1.937	309.8	308.9	309.2	309.8	309.8	310.2	308.2	308.2	309.2	309.2	309.2	308.2	309.2
	1238.308	176.7	1.964	309.0	307.9	308.0	308.7	308.7	308.3	307.2	307.2	308.2	308.2	308.2	308.2	308.2
	1338.514	165.8	1.969	307.6	306.9	307.3	308.1	308.0	308.0	306.7	307.2	307.7	307.2	307.7	306.7	307.2
14	***	***	1.968	306.3	305.5	306.5	307.5	306.9	306.8	306.2	306.2	307.2	307.2	307.2	306.2	307.2
15	***	***	1.966	305.9	304.7	305.9	307.1	306.7	306.4	306.2	306.2	307.2	307.2	307.2	306.2	306.2
16	***	***	1.964	306.1	305.0	305.7	306.6	306.4	306.4	305.2	305.2	307.2	307.2	307.2	306.2	306.2
17	***	***	1.963	306.1	304.8	305.3	306.0	305.6	305.8	305.2	305.2	306.7	306.2	307.2	306.2	306.2
18	***	***	1.961	305.9	304.4	304.6	305.5	305.3	305.6	305.2	305.2	306.2	306.2	306.2	306.2	306.2
19	***	***	1.960	305.5	304.0	304.1	305.2	305.0	305.2	305.2	305.2	306.2	306.2	306.2	305.7	305.7
20	***	***	1.958	305.0	303.8	304.0	305.0	304.9	305.2	305.2	304.2	306.2	306.2	306.2	305.2	305.2
21	***	***	1.957	305.0	303.8	303.4	304.5	304.7	305.1	304.2	304.2	306.2	306.2	306.2	305.2	305.2
26	***	***	1.952	305.0	304.0	303.7	304.6	304.5	304.2	303.2	303.2	304.2	305.2	305.2	304.2	303.7
31	***	***	1.949	304.5	303.4	303.0	303.8	303.8	303.7	303.2	304.2	305.2	305.2	305.2	304.2	304.2
36	***	***	1.946	304.2	303.1	303.1	303.8	303.8	304.0	303.2	303.2	304.7	304.2	304.2	303.2	304.2
41	***	***	1.943	303.9	302.6	302.6	303.5	303.5	303.9	303.2	303.2	304.2	304.2	304.2	303.2	303.2
46	***	***	1.941	303.5	302.4	302.4	303.1	303.1	303.2	302.2	302.2	303.2	303.2	303.2	303.2	303.2
51	***	***	1.939	302.6	301.8	301.8	302.7	302.7	302.9	302.2	302.2	303.2	303.2	303.2	302.2	302.2
56	***	***	1.936	302.6	301.5	301.6	302.5	302.4	302.7	302.2	301.2	303.2	303.2	303.2	302.2	302.2
61	***	***	1.935	302.6	301.2	301.0	301.5	302.4	302.9	301.2	301.2	303.2	303.2	303.2	302.2	302.2
66	***	***	1.933	302.4	300.9	300.2	300.5	302.2	302.2	301.2	301.2	302.2	302.2	302.2	301.2	301.2
71	***	***	1.932	302.4	301.1	300.8	301.6	302.2	302.3	301.2	301.2	302.2	302.2	301.2	301.2	301.2
81	***	***	1.929	302.2	301.2	301.0	302.1	302.1	302.2	301.2	301.2	302.2	302.2	301.2	299.7	301.2
91	***	***	1.926	302.3	300.8	300.7	301.4	301.6	301.8	301.2	300.2	301.2	302.2	301.2	300.2	300.2
101	***	***	1.924	301.7	300.4	300.3	301.3	301.5	301.6	300.2	299.7	301.2	301.2	301.2	299.2	300.2
111	***	***	1.922	301.2	299.5	300.1	301.2	301.2	301.0	300.2	299.2	300.2	301.2	300.2	299.2	300.2
121	***	***	1.920	300.9	299.0	300.0	300.9	301.0	301.1	300.2	300.2	300.2	300.2	300.2	299.2	300.2
131	***	***	1.919	300.5	299.1	299.8	300.8	300.9	300.9	300.2	300.2	300.2	300.2	300.2	299.2	300.2
141	***	***	1.917	300.5	299.1	299.1	300.2	300.5	300.9	300.2	299.2	300.2	300.2	300.2	299.2	299.2
151	***	***	1.915	300.4	299.0	299.0	299.9	300.3	300.6	299.2	299.2	300.2	300.2	300.2	299.2	299.2
161	***	***	1.913	300.2	298.9	299.0	299.9	299.5	299.8	299.2	299.2	300.2	300.2	300.2	298.2	299.2
171	***	***	1.912	300.1	298.8	298.8	299.7	299.6	299.7	299.2	298.2	300.2	300.2	300.2	299.2	299.2
181	***	***	1.910	299.9	298.7	298.6	299.5	299.6	299.5	299.2	298.2	300.2	299.2	299.2	299.2	299.2
191	***	***	1.909	299.7	298.5	298.2	299.4	299.5	299.5	299.2	298.2	299.2	299.2	299.2	298.2	298.2
201	***	***	1.908	299.5	298.1	298.0	299.1	298.7	299.1	298.2	298.2	299.2	299.2	299.2	298.2	298.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	1.756	45	-0.586
2	1.756	45	-0.293
3	1.756	45	0.000
4	1.756	45	0.293
5	1.756	45	0.586
6	1.756	45	0.878
7	1.756	45	2.049
8	1.756	45	2.342
9	1.756	45	2.635
10	1.756	45	2.928
11	1.756	45	3.220
12	1.756	45	3.513
13	1.756	45	3.806

Table 9A — Scaling Run 237: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	.979	281.8	280.8	280.9	281.9	281.8	281.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-4	***	***	.979	281.9	280.8	280.9	281.9	281.7	281.7	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-3	***	***	.979	281.8	280.8	280.9	281.9	281.8	281.7	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-2	***	***	.979	281.8	280.8	280.9	281.9	281.8	281.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2
-1	***	***	.979	283.3	280.9	282.4	281.7	283.1	283.7	281.2	281.2	282.2	282.2	282.2	282.2	281.2
0	.503	253.6	1.025	289.4	283.4	277.2	284.7	288.6	289.4	283.2	285.7	285.7	284.7	283.7	284.2	282.2
1	.503	249.9	1.147	294.4	288.0	277.9	290.3	292.9	293.2	288.2	291.2	291.2	290.2	290.2	279.2	286.2
2	.497	247.3	1.260	298.6	291.7	279.1	292.2	295.5	295.6	292.2	294.2	294.7	293.7	293.7	280.7	288.7
3	.497	244.7	1.363	299.7	292.4	279.5	295.3	297.5	296.9	295.2	296.2	298.2	297.2	294.2	280.2	293.2
4	.490	242.4	1.456	301.3	294.5	279.4	296.4	298.6	298.5	297.7	298.2	299.2	298.7	297.2	280.7	295.7
5	.490	240.7	1.541	301.8	296.7	279.6	298.1	299.8	299.5	298.2	299.2	300.2	300.2	298.2	281.2	296.2
6	.486	238.5	1.618	302.2	296.8	280.6	299.2	300.0	300.7	297.7	299.2	300.7	300.7	298.7	281.7	295.2
7	.483	236.0	1.690	302.3	297.8	280.9	300.1	301.1	300.4	298.2	298.2	300.2	300.2	298.2	282.2	295.2
8	.483	232.5	1.756	302.3	296.8	280.3	299.3	299.7	299.4	298.7	299.2	300.7	300.7	298.2	281.2	298.7
9	.476	230.1	1.818	301.8	297.7	280.3	299.9	299.5	298.4	298.2	299.2	301.2	300.2	298.2	282.2	298.2
10	.456	228.4	1.874	301.4	297.6	279.7	298.8	299.5	299.5	298.2	298.7	300.2	300.2	297.2	281.2	298.2
11	.435	200.1	1.923	300.8	297.4	281.4	299.0	299.9	299.8	298.2	298.2	299.2	299.2	297.2	280.2	297.2
12	.435	161.4	1.937	299.9	298.2	290.4	295.7	299.1	299.0	297.7	298.7	300.2	300.2	297.2	286.2	297.2
13	.435	165.1	1.938	298.5	297.6	295.2	297.8	298.5	298.3	298.2	298.2	300.2	299.2	298.2	292.2	298.2
14	***	***	1.937	298.0	296.5	295.1	296.9	297.2	297.3	297.7	298.2	299.2	299.2	298.7	295.2	298.2
15	***	***	1.935	297.9	296.5	295.5	297.2	297.1	296.8	297.2	298.2	299.2	299.2	299.2	297.2	298.2
16	***	***	1.934	297.6	296.4	295.9	297.4	297.2	297.1	297.2	297.7	298.7	298.2	298.2	297.2	298.2
17	***	***	1.933	297.4	296.4	296.0	297.3	297.1	297.0	296.2	297.2	298.2	298.2	298.2	296.2	298.2
18	***	***	1.931	297.3	296.1	295.9	297.3	297.1	296.8	297.2	297.2	298.2	298.2	298.2	297.2	297.2
19	***	***	1.930	297.1	295.8	295.6	296.9	296.6	296.5	297.2	297.2	298.2	298.2	298.2	297.2	297.2
20	***	***	1.929	296.8	295.5	295.2	296.6	296.4	296.3	296.7	296.7	297.7	297.7	298.2	296.2	297.2
21	***	***	1.928	296.7	295.5	295.2	296.4	296.1	296.5	296.2	296.2	297.2	297.2	298.2	296.2	297.2
26	***	***	1.924	296.0	295.0	294.8	296.0	295.7	295.6	295.2	295.7	297.2	297.2	297.2	296.2	295.7
31	***	***	1.921	295.2	294.4	294.5	295.6	295.5	295.4	295.2	295.2	297.2	297.2	297.2	296.2	296.2
36	***	***	1.918	295.0	293.9	294.2	294.8	294.8	294.7	295.2	295.2	296.2	296.2	297.2	292.2	296.2
41	***	***	1.916	294.7	293.9	293.5	294.8	294.9	294.7	295.2	295.2	295.2	295.2	295.2	291.2	295.2
46	***	***	1.914	294.5	293.5	293.0	294.2	294.7	294.6	295.2	294.2	295.2	295.2	295.2	290.2	295.2
51	***	***	1.912	294.5	293.3	292.6	293.1	293.4	293.5	294.2	293.2	294.2	294.2	294.2	289.2	294.2
56	***	***	1.910	294.0	292.8	292.4	292.9	293.0	292.5	292.7	292.2	293.2	293.7	294.2	290.2	294.2
61	***	***	1.908	293.8	292.6	291.7	292.4	292.5	292.0	292.2	291.2	294.2	294.2	294.2	290.2	294.2
66	***	***	1.906	293.6	292.4	290.3	292.5	292.4	291.9	292.2	291.2	293.2	293.2	293.2	289.2	292.2
71	***	***	1.905	293.0	291.5	290.6	292.4	292.4	292.0	292.2	291.2	293.2	293.2	293.2	289.2	292.2
81	***	***	1.902	292.2	291.1	291.3	292.3	292.2	292.4	292.2	292.2	293.2	293.2	293.2	291.2	292.2
91	***	***	1.900	292.4	291.4	291.6	292.5	292.6	292.6	292.2	292.2	293.2	293.2	293.2	291.2	292.2
101	***	***	1.897	291.9	291.0	290.8	292.0	292.2	292.4	292.2	292.2	292.2	293.2	292.2	290.2	292.2
111	***	***	1.895	291.7	290.6	290.4	291.4	291.4	291.1	291.2	291.2	292.2	292.2	292.2	291.2	291.2
121	***	***	1.893	291.5	290.5	290.3	291.1	291.1	290.9	291.2	291.2	292.2	292.2	292.2	290.2	291.2
131	***	***	1.891	291.0	289.9	289.9	291.0	290.9	290.6	290.2	290.2	292.2	291.2	291.2	289.2	291.2
141	***	***	1.890	290.8	289.6	289.6	290.7	290.6	290.6	290.2	290.2	291.2	291.2	291.2	289.2	291.2
151	***	***	1.888	290.5	289.5	289.3	290.2	290.3	290.4	290.2	290.2	291.2	291.2	291.2	290.2	290.2
161	***	***	1.886	290.1	289.1	288.8	289.7	289.8	289.7	290.2	290.2	291.2	291.2	291.2	289.2	290.2
171	***	***	1.885	289.7	288.8	288.6	289.6	289.5	289.6	289.2	289.2	291.2	290.2	290.2	289.2	290.2
181	***	***	1.883	289.5	288.8	288.3	289.5	289.2	289.4	289.2	289.2	290.2	290.2	290.2	288.2	289.2
191	***	***	1.882	289.3	288.3	287.7	289.0	288.9	288.9	289.2	289.2	290.2	290.2	290.2	288.2	289.2
201	***	***	1.880	289.2	288.2	287.9	288.9	288.8	288.8	289.2	288.7	290.2	289.2	290.2	289.2	289.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.678
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 10A — Scaling Run 238: Uncluttered 324–m³ Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	.985	280.1	279.1	279.1	280.0	280.0	280.0	280.2	280.2	280.2	280.2	280.2	280.2	279.2
-4	***	***	.985	280.2	279.1	279.1	280.0	280.0	280.0	280.2	279.2	280.2	280.2	280.2	280.2	279.2
-3	***	***	.985	280.1	279.1	279.1	280.0	280.0	280.0	280.2	279.7	280.7	280.2	280.2	280.2	279.2
-2	***	***	.985	280.1	279.2	279.1	280.0	280.0	280.0	280.2	280.2	280.2	280.2	280.2	280.2	279.2
-1	***	***	.985	280.1	279.1	279.1	280.0	280.0	279.9	280.2	279.2	280.7	280.2	280.2	280.2	279.2
0	91.796	277.0	.986	281.8	279.4	281.3	280.2	281.4	281.9	280.2	280.2	280.2	280.2	281.2	280.2	280.2
1	76.061	257.9	1.052	289.1	284.2	275.5	283.5	287.5	288.1	283.7	285.2	286.2	285.2	284.2	280.2	281.2
2	72.122	255.0	1.178	294.7	289.5	277.7	289.6	292.5	292.3	289.2	290.2	291.2	290.2	290.2	279.2	286.2
3	66.344	252.7	1.291	297.5	291.1	279.7	293.2	295.5	296.2	293.2	293.7	294.2	293.7	291.2	280.7	290.2
4	61.041	249.8	1.395	299.3	292.8	280.4	295.9	297.5	297.0	296.2	296.2	297.2	297.2	296.2	281.2	293.2
5	56.344	245.5	1.488	301.4	295.5	280.6	296.5	297.7	297.4	297.7	297.7	299.2	298.7	297.2	281.2	294.7
6	52.034	243.1	1.574	301.5	296.0	280.5	298.5	299.3	298.5	298.2	298.2	300.2	300.2	297.2	282.2	294.2
7	48.119	239.3	1.651	301.4	296.9	279.6	298.2	300.2	300.5	298.2	299.2	300.2	300.2	297.7	281.2	293.7
8	44.694	237.5	1.722	301.7	296.2	280.9	298.4	300.1	298.6	298.2	300.2	301.2	301.2	298.2	281.2	296.2
9	42.585	234.7	1.766	301.9	296.7	279.4	298.2	299.4	298.5	300.2	298.2	301.2	300.2	297.2	280.2	296.2
10	39.592	232.6	1.828	301.2	295.1	279.5	298.4	298.8	298.1	298.2	298.2	299.7	299.7	297.7	280.2	296.7
11	36.871	228.7	1.885	300.0	296.2	279.9	298.6	298.9	297.9	297.2	298.2	300.2	299.2	296.2	281.2	298.2
12	37.422	180.3	1.929	299.5	292.2	280.0	297.7	297.7	298.1	297.2	297.7	299.7	299.7	296.2	279.7	295.2
13	37.027	159.2	1.941	297.8	293.0	290.8	298.3	298.4	298.2	296.2	297.2	298.2	298.2	296.2	286.2	289.2
14	***	***	1.941	297.4	295.2	294.9	297.8	297.7	297.2	297.7	297.7	298.2	298.2	297.7	292.2	294.2
15	***	***	1.939	296.8	295.5	295.2	297.3	296.9	296.4	297.2	297.2	298.2	298.2	298.2	296.2	296.2
16	***	***	1.938	296.4	295.0	295.0	296.5	296.2	296.0	297.2	297.2	298.2	298.2	298.2	296.7	296.7
17	***	***	1.936	296.4	295.1	295.1	296.2	295.7	295.6	297.2	297.2	298.2	298.2	298.2	296.2	296.2
18	***	***	1.935	296.0	295.2	295.2	296.2	295.9	295.8	297.2	296.2	298.2	298.2	298.2	296.2	296.2
19	***	***	1.934	295.5	294.6	294.8	295.8	295.7	295.6	296.2	296.2	297.2	297.2	297.2	296.2	296.7
20	***	***	1.933	294.9	294.4	294.8	295.6	295.4	295.5	296.2	296.2	297.2	297.2	297.2	296.2	296.2
21	***	***	1.932	295.1	294.3	294.9	295.7	295.6	295.5	296.2	296.2	297.2	297.2	297.2	294.7	296.2
26	***	***	1.927	294.8	293.8	293.9	294.6	294.8	294.8	295.2	295.2	296.2	296.2	296.2	294.2	295.2
31	***	***	1.924	294.5	293.3	293.1	293.7	293.8	294.3	295.2	295.2	295.2	295.2	296.2	294.2	295.2
36	***	***	1.920	293.9	293.0	293.1	293.8	294.1	294.1	294.2	294.7	295.2	295.2	295.2	294.2	294.2
41	***	***	1.918	293.5	292.3	291.5	293.5	294.2	294.0	294.2	294.2	295.2	295.2	294.2	291.7	294.2
46	***	***	1.916	293.1	292.2	292.0	293.1	293.5	293.5	294.2	294.2	294.2	294.2	294.2	291.2	293.2
51	***	***	1.914	292.4	291.3	291.7	292.6	293.2	293.1	293.2	294.2	294.7	294.2	294.2	290.2	293.2
56	***	***	1.912	291.9	290.9	290.4	291.2	292.8	292.9	293.2	293.2	294.2	293.2	293.2	289.2	293.2
61	***	***	1.910	292.4	290.9	290.6	291.1	291.9	291.9	293.2	292.2	292.7	293.2	293.2	288.2	292.2
66	***	***	1.909	292.3	291.5	291.3	291.9	291.9	292.2	292.2	292.2	292.2	292.2	292.2	289.2	291.2
71	***	***	1.907	292.0	291.0	291.0	291.7	291.8	292.1	291.7	291.2	292.2	291.2	291.7	290.2	291.2
81	***	***	1.905	292.0	290.8	290.7	291.7	291.5	291.5	291.2	291.2	292.2	292.2	292.2	290.7	291.2
91	***	***	1.902	291.4	290.4	290.2	291.3	291.3	291.4	291.2	291.2	291.7	292.2	292.2	291.2	291.2
101	***	***	1.900	291.1	290.0	289.9	290.9	291.0	291.1	291.2	291.2	292.2	292.2	292.2	289.2	291.2
111	***	***	1.898	290.9	290.1	290.1	291.0	291.0	290.7	291.2	291.2	292.2	292.2	292.2	290.2	290.2
121	***	***	1.896	290.7	289.9	289.8	290.9	290.9	290.7	290.2	290.2	292.2	291.2	291.2	289.2	290.2
131	***	***	1.894	290.6	289.5	289.5	290.5	290.5	290.6	290.2	290.2	291.2	290.2	290.2	288.2	290.2
141	***	***	1.893	290.4	289.3	289.5	290.4	290.1	290.2	290.2	289.2	290.2	290.2	290.2	289.2	289.2
151	***	***	1.891	290.1	289.0	289.0	289.7	289.7	289.6	290.2	289.2	290.2	290.2	290.2	289.2	289.2
161	***	***	1.890	289.6	288.8	288.8	289.6	289.5	289.5	289.2	289.2	290.2	290.2	290.2	288.2	289.2
171	***	***	1.888	289.4	288.4	288.3	289.3	289.3	289.3	289.2	289.2	290.2	290.2	290.2	287.2	289.2
181	***	***	1.887	289.3	288.3	288.4	289.3	289.3	289.0	289.2	288.2	290.2	289.2	289.2	288.2	288.2
191	***	***	1.885	289.1	288.1	288.1	289.0	288.8	288.8	288.2	288.2	289.2	289.2	289.2	288.2	288.2
201	***	***	1.884	288.8	288.1	287.9	288.8	288.6	288.6	288.2	288.2	289.2	289.2	289.2	288.2	289.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.606

Table 11A — Scaling Run 239: Uncluttered 324–m³ Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.1	274.2	274.2	275.2	275.2	275.2	274.2	273.2
-4	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2
-3	***	***	.996	274.2	273.3	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2
-2	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.1	274.2	274.2	275.2	275.2	275.2	274.2	273.2
-1	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2
0	87.663	265.6	.996	276.5	273.9	271.4	274.7	276.4	277.3	274.2	274.7	275.2	275.2	275.2	280.7	273.7
1	78.810	248.4	1.057	283.8	278.1	267.2	278.7	281.5	282.1	277.2	279.2	279.2	278.2	278.2	271.2	275.2
2	72.446	247.6	1.182	288.5	282.9	271.3	283.4	286.3	286.9	282.2	284.2	284.7	284.2	283.2	272.7	279.7
3	66.163	246.7	1.297	291.8	287.2	273.3	285.2	288.6	288.1	286.2	287.2	288.2	287.2	286.2	273.2	283.2
4	60.929	244.2	1.399	293.1	288.8	273.9	287.5	290.2	289.9	289.2	289.7	290.7	290.2	289.7	273.7	266.2
5	56.075	238.3	1.492	293.8	287.5	272.8	288.9	290.9	290.7	290.2	290.2	292.2	292.2	291.2	273.2	289.2
6	51.895	235.2	1.577	294.6	289.2	272.6	290.7	291.8	291.5	291.2	291.7	293.2	292.2	291.2	274.2	267.7
7	47.939	232.3	1.654	294.9	290.5	272.9	291.0	293.7	293.5	290.2	290.2	292.2	293.2	289.2	274.2	269.2
8	44.537	229.1	1.726	294.8	290.4	272.3	292.7	293.5	291.6	291.2	292.2	293.2	293.7	291.7	273.2	289.2
9	41.374	226.4	1.792	294.2	290.3	272.1	291.3	292.4	292.0	291.2	292.2	293.2	293.2	292.2	274.2	292.2
10	39.395	223.8	1.834	294.4	290.4	272.2	291.3	293.2	293.1	291.2	292.2	293.2	293.2	291.2	273.2	291.2
11	36.762	223.0	1.891	294.5	290.5	272.5	291.5	291.8	291.5	292.2	292.2	293.2	293.2	291.2	273.2	290.2
12	35.667	182.9	1.938	292.8	287.4	272.8	291.2	291.3	290.4	292.2	292.2	293.2	293.2	291.2	273.2	290.2
13	35.976	159.5	1.947	289.8	286.5	280.8	290.4	290.5	290.6	291.2	290.7	291.7	291.7	290.2	279.2	285.7
14	36.116	164.1	1.947	290.4	288.2	265.8	290.2	290.1	289.9	290.2	290.2	291.2	291.2	290.2	286.2	288.2
15	***	***	1.946	289.8	288.5	287.3	289.9	289.6	289.7	289.2	269.2	290.2	290.2	290.7	286.7	289.2
16	***	***	1.944	289.5	288.2	287.4	289.8	289.8	289.7	290.2	269.2	290.2	290.2	290.2	287.2	269.2
17	***	***	1.943	289.4	288.1	287.6	289.6	289.5	289.5	290.2	289.2	290.2	290.2	290.2	288.2	289.7
18	***	***	1.941	288.8	287.7	287.7	289.4	289.3	289.3	289.2	289.2	290.2	290.2	290.2	287.2	290.2
19	***	***	1.940	288.2	287.8	287.2	288.5	288.4	288.5	289.2	289.2	290.2	290.2	290.2	287.2	290.2
20	***	***	1.939	288.4	286.8	287.0	288.5	288.2	288.1	289.2	289.2	290.2	290.7	291.2	288.2	290.2
21	***	***	1.938	288.9	287.4	287.2	288.3	288.0	288.0	289.2	289.2	290.2	290.2	290.2	288.2	290.2
22	***	***	1.937	288.8	287.3	287.5	288.6	288.4	288.4	288.2	288.7	289.7	289.7	289.7	289.2	289.2
27	***	***	1.933	288.1	286.9	287.1	288.1	288.0	288.0	288.2	288.2	289.2	289.2	289.2	288.2	288.2
32	***	***	1.930	287.5	286.3	285.9	287.5	287.9	287.9	288.2	287.2	289.2	289.2	289.2	288.2	288.2
37	***	***	1.927	287.3	286.0	285.4	286.5	286.4	286.4	287.2	287.2	288.2	288.7	289.2	287.2	287.7
42	***	***	1.924	286.4	285.0	285.3	286.8	286.4	286.6	287.2	287.2	287.7	288.2	288.2	287.2	287.2
47	***	***	1.922	286.7	285.5	285.7	286.7	286.6	286.5	287.2	286.2	287.2	288.2	288.2	286.2	287.2
52	***	***	1.920	286.5	285.3	285.0	286.3	286.2	286.2	286.2	286.2	287.2	287.2	287.2	286.2	287.2
57	***	***	1.919	286.2	285.1	285.0	285.9	285.9	285.5	285.7	285.2	286.2	287.2	287.2	284.7	286.2
62	***	***	1.917	286.2	284.9	284.7	285.8	285.5	285.4	285.7	285.2	286.2	286.2	286.2	285.2	286.2
67	***	***	1.915	285.9	284.8	284.7	285.6	285.5	285.4	285.2	284.2	286.2	286.2	286.2	283.2	285.2
72	***	***	1.914	285.5	284.5	284.5	285.8	285.8	285.4	285.2	285.2	286.2	285.2	285.2	282.2	284.2
82	***	***	1.911	284.8	283.6	283.5	284.5	284.7	285.0	284.2	284.2	285.2	285.2	285.2	284.2	284.2
92	***	***	1.909	284.8	283.8	283.8	284.8	284.7	284.6	284.2	284.2	285.2	285.2	285.2	284.2	284.2
102	***	***	1.907	284.8	283.7	283.8	284.8	284.7	284.7	284.2	284.2	285.2	285.2	285.2	284.2	284.2
112	***	***	1.905	284.5	283.5	283.5	284.4	284.2	284.4	284.2	284.2	284.7	285.2	285.2	283.2	284.2
122	***	***	1.903	283.8	282.6	282.5	283.7	283.6	283.8	284.2	283.2	284.2	284.2	284.2	283.2	284.2
132	***	***	1.901	283.8	282.7	282.5	283.5	283.4	283.5	283.2	283.2	284.2	284.2	284.2	283.2	283.2
142	***	***	1.900	283.7	282.6	282.7	283.8	283.4	283.7	283.2	283.2	284.2	284.2	284.2	282.2	283.2
152	***	***	1.898	283.6	282.7	282.3	283.4	283.4	283.3	283.2	283.2	284.2	283.2	284.2	282.2	283.2
162	***	***	1.897	283.1	281.9	282.2	283.2	283.0	282.8	283.2	282.2	283.7	283.2	283.2	282.2	282.2
172	***	***	1.895	282.9	281.8	281.8	282.8	282.7	282.7	282.2	282.2	283.2	283.2	283.2	281.2	282.2
182	***	***	1.894	282.8	281.8	281.7	282.7	282.5	282.4	282.2	282.2	283.2	283.2	283.2	281.2	282.2
192	***	***	1.893	282.9	281.9	281.9	282.8	282.2	282.3	282.2	282.2	283.2	283.2	283.2	281.2	282.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 12A — Scaling Run 240: Uncluttered 324–m^3 Chamber, Three 3.279-cm Nozzles

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	•••	•••	.993	275.3	274.3	274.2	275.2	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2
-4	•••	•••	.993	275.3	274.2	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2
-3	•••	•••	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2
-2	•••	•••	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2
-1	•••	•••	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2
0	94.607	274.2	.993	275.7	274.7	275.7	275.5	275.5	276.0	274.2	274.7	275.7	275.7	275.7	281.7	274.2
1	78.906	254.8	1.045	282.9	278.3	270.2	278.4	281.7	282.4	277.2	279.2	280.2	279.2	278.2	273.2	275.2
2	75.235	250.3	1.170	288.3	284.7	271.2	283.3	288.1	288.8	283.2	284.2	285.2	284.2	284.2	273.2	277.7
3	69.347	249.9	1.285	292.4	287.3	274.3	287.0	290.3	289.8	287.2	287.2	289.2	289.2	288.2	273.2	281.2
4	63.939	246.9	1.387	294.2	287.3	274.7	289.9	292.2	292.0	289.2	289.7	291.2	290.7	288.7	274.2	283.7
5	59.061	241.9	1.479	295.3	290.3	275.0	291.5	293.1	293.1	291.2	291.2	293.2	292.2	290.2	276.2	285.2
6	54.796	238.6	1.564	295.9	290.6	274.8	291.6	293.8	293.8	291.7	292.2	293.2	293.2	291.7	275.2	284.7
7	50.735	235.2	1.641	295.7	290.2	274.3	292.9	294.0	293.2	291.2	293.2	294.2	293.2	291.2	274.2	289.2
8	47.248	233.1	1.713	295.9	289.9	274.1	292.9	294.1	294.2	292.2	292.7	294.2	294.2	291.2	275.2	290.2
9	44.116	230.8	1.778	296.0	289.3	274.0	293.8	294.5	293.1	292.2	292.2	293.2	293.2	291.2	274.2	290.2
10	42.048	228.9	1.819	296.3	291.9	274.7	293.4	294.2	293.8	292.2	292.2	293.2	293.2	292.2	274.2	292.2
11	39.320	226.5	1.875	295.2	291.5	273.9	293.2	293.8	294.4	292.2	292.2	294.2	294.2	291.2	275.2	289.7
12	39.054	199.9	1.927	294.7	290.0	274.5	293.9	294.3	293.4	291.2	292.2	293.2	293.2	291.2	274.2	287.2
13	38.616	160.5	1.950	293.7	290.6	279.9	293.3	293.3	293.5	292.2	291.7	292.7	292.7	291.2	281.2	288.2
14	38.864	164.6	1.952	293.1	291.0	288.6	293.1	292.4	291.7	290.2	290.2	292.2	291.2	291.2	288.2	289.2
15	•••	•••	1.931	292.2	290.8	289.6	292.4	291.7	291.6	290.7	290.2	291.2	291.2	291.2	289.2	289.7
16	•••	•••	1.949	291.7	290.4	289.6	291.7	291.5	291.3	290.2	290.2	291.2	291.2	292.2	289.2	290.2
17	•••	•••	1.947	291.5	290.0	289.3	291.3	290.9	290.9	290.2	290.2	291.2	291.2	291.2	289.7	290.2
18	•••	•••	1.946	291.2	289.7	289.5	290.7	290.7	290.8	290.2	290.2	291.2	291.2	291.2	289.2	290.2
19	•••	•••	1.945	291.0	289.5	289.4	290.4	290.0	290.6	290.2	290.2	291.2	291.2	291.2	288.2	290.2
20	•••	•••	1.944	290.7	289.4	289.4	290.0	289.9	290.5	290.2	290.2	291.2	291.2	291.2	289.2	290.2
21	•••	•••	1.943	290.5	289.2	289.3	290.0	289.9	290.2	289.2	289.2	291.2	291.2	291.2	289.2	290.2
22	•••	•••	1.942	290.2	289.0	288.9	289.5	289.6	289.7	289.2	289.2	290.2	290.7	291.2	289.2	290.2
27	•••	•••	1.938	288.8	287.7	287.8	289.3	288.8	288.9	289.2	289.2	290.2	290.2	290.2	289.2	289.2
32	•••	•••	1.934	288.8	288.1	288.1	288.8	289.1	289.0	289.2	289.2	290.2	290.2	290.2	288.2	288.2
37	•••	•••	1.931	288.4	287.3	287.4	288.7	288.6	288.9	288.2	288.2	289.2	289.2	289.2	286.7	288.2
42	•••	•••	1.929	288.3	286.5	287.2	288.1	288.5	288.5	288.2	288.2	289.2	289.2	289.2	287.7	288.2
47	•••	•••	1.927	286.9	285.7	285.5	286.8	286.9	287.0	287.2	287.2	288.2	288.2	289.2	287.2	287.2
52	•••	•••	1.925	287.3	286.2	285.1	286.4	287.0	286.8	287.2	287.2	288.2	288.2	288.2	286.2	287.2
57	•••	•••	1.923	287.7	285.8	284.9	286.6	287.0	286.3	286.2	286.2	287.2	287.2	287.2	284.7	286.7
62	•••	•••	1.921	287.2	284.7	285.0	285.9	285.8	285.5	287.2	287.2	287.2	287.7	287.2	283.2	286.2
67	•••	•••	1.920	286.5	284.7	284.8	285.9	285.8	286.0	286.2	286.2	286.2	286.2	286.2	283.2	285.2
72	•••	•••	1.918	286.4	285.1	285.0	286.1	286.3	286.2	285.2	285.2	286.2	286.2	286.2	284.2	285.2
82	•••	•••	1.916	286.5	285.5	285.4	286.3	286.3	286.3	285.2	285.2	286.2	286.2	286.2	285.2	285.2
92	•••	•••	1.913	286.5	285.5	285.4	286.4	286.2	285.9	285.2	285.2	286.2	286.2	286.2	285.2	285.2
102	•••	•••	1.911	286.1	284.9	284.8	285.9	286.0	286.0	285.2	285.2	286.2	286.2	286.2	285.2	285.2
112	•••	•••	1.909	285.9	284.8	284.8	285.9	285.8	285.8	285.2	284.2	285.2	285.2	286.2	284.2	285.2
122	•••	•••	1.907	285.3	284.3	284.3	285.4	285.3	285.2	285.2	284.2	285.2	285.2	285.2	284.2	284.2
132	•••	•••	1.906	285.2	284.1	284.2	285.3	285.4	285.2	284.2	284.2	285.2	285.2	285.2	284.2	284.2
142	•••	•••	1.904	284.9	283.9	283.9	285.0	284.5	284.8	284.2	284.2	285.2	285.2	284.2	283.2	284.2
152	•••	•••	1.902	284.8	283.8	283.7	284.7	284.5	284.5	284.2	283.2	284.2	284.2	284.2	283.2	283.2
162	•••	•••	1.901	284.5	283.5	283.5	284.3	284.3	284.4	283.2	283.2	284.2	284.2	284.2	282.7	283.2
172	•••	•••	1.899	284.2	283.1	283.0	284.3	284.2	284.2	283.2	283.2	284.2	284.2	284.2	282.2	283.2
182	•••	•••	1.898	284.0	283.0	282.9	284.0	283.9	283.7	283.2	283.2	284.2	284.2	284.2	282.2	283.2
192	•••	•••	1.897	283.7	282.7	282.7	283.8	283.8	283.8	283.2	283.2	283.2	284.2	284.2	283.2	282.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 13A — Scaling Run 241: Cluttered 324–m³ Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2
-4	***	***	1.009	289.6	289.2	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2
-3	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2
-2	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2
-1	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.6	290.2	290.2	290.2	290.2	290.2	290.2	290.2
094.269		290.6	1.010	289.7	289.2	289.1	289.6	289.6	289.6	290.2	290.2	290.2	290.2	290.2	290.2	290.2
185.490		301.8	1.036	293.6	292.4	291.0	292.1	292.5	293.8	290.2	291.2	291.2	291.2	291.2	290.2	290.2
282.405		275.6	1.091	297.8	296.9	296.5	296.9	297.5	298.1	293.2	293.2	294.7	294.2	294.7	293.2	293.2
379.408		268.4	1.143	300.5	299.7	299.4	299.9	300.4	300.5	295.2	296.2	298.2	297.2	297.2	296.2	296.2
476.265		266.3	1.192	302.6	301.8	301.7	302.3	302.4	302.6	299.2	298.7	299.7	299.7	300.2	298.7	299.2
572.701		262.6	1.237	302.6	302.5	303.1	303.8	303.4	303.5	302.2	302.2	301.2	302.2	302.2	301.2	302.2
668.303		263.0	1.281	303.6	303.7	304.2	304.6	305.4	305.7	303.7	304.2	303.7	304.7	305.7	303.7	304.2
763.347		262.2	1.323	304.9	305.0	304.9	305.9	306.1	305.9	305.2	306.2	306.2	306.2	306.2	305.2	305.2
864.382		261.2	1.363	305.8	305.2	304.5	306.4	306.3	306.1	307.2	306.7	307.7	307.7	307.7	306.7	306.2
970.122		260.4	1.402	307.4	306.7	307.0	307.3	307.3	307.4	309.2	308.2	300.2	308.2	308.2	307.2	306.2
1068.714		258.9	1.427	306.9	306.3	307.5	307.0	306.6	306.6	310.2	309.2	308.2	308.2	308.2	307.2	307.2
1166.724		258.9	1.463	307.3	307.3	307.3	308.1	307.9	307.8	310.7	310.2	308.7	308.7	308.2	307.2	307.2
1264.694		257.7	1.498	308.7	308.3	308.9	309.1	308.6	308.2	311.2	311.2	309.2	309.2	309.2	307.2	307.2
1362.806		256.7	1.531	307.0	307.0	307.8	307.5	306.6	306.1	312.2	311.2	309.2	309.2	309.2	308.2	307.7
1460.932		256.9	1.563	307.9	306.8	306.1	307.4	307.8	307.9	311.2	312.2	309.2	310.2	310.2	309.2	309.2
1559.099		255.7	1.595	306.6	307.9	308.0	308.8	309.7	310.4	311.7	310.2	310.7	310.7	311.7	309.7	310.7
1657.408		253.6	1.625	307.3	306.8	306.8	308.1	309.4	310.3	312.2	312.2	311.2	311.2	312.2	310.2	310.2
1755.779		254.1	1.655	308.7	308.3	308.3	309.0	309.2	309.3	313.2	312.7	311.2	310.2	311.2	309.7	308.7
1854.184		252.3	1.684	308.1	307.9	308.9	308.8	308.7	309.0	314.2	313.2	311.2	312.2	311.2	308.2	308.2
1953.177		252.0	1.702	307.5	307.3	306.6	307.3	307.8	308.4	314.2	314.2	310.2	311.2	311.2	309.2	308.2
2051.650		251.5	1.729	307.0	307.0	306.9	307.5	307.8	307.1	314.2	313.7	311.2	312.7	312.2	310.2	309.7
2150.218		251.9	1.756	307.6	306.6	306.6	306.6	306.8	308.3	314.2	312.2	312.2	312.2	311.2	309.2	309.2
2248.765		250.5	1.781	307.8	307.3	306.7	306.8	306.6	307.0	313.2	313.2	310.2	310.2	310.2	308.2	309.2
2347.279		249.8	1.806	308.5	307.9	307.5	308.4	308.6	309.1	314.2	311.2	310.2	311.2	311.2	309.2	309.2
2445.871		249.1	1.830	308.4	308.0	308.0	309.1	308.8	309.3	314.2	312.7	310.2	309.7	309.2	308.7	308.7
2544.469		248.1	1.854	309.9	309.4	308.8	310.2	310.0	310.0	314.2	313.2	309.2	309.2	308.2	307.2	307.2
2643.728		247.8	1.869	309.0	308.4	308.4	308.9	308.9	307.9	314.2	313.2	310.2	309.2	309.2	307.2	307.2
2742.384		246.9	1.892	308.0	307.0	306.9	307.6	307.2	307.1	314.2	312.7	309.2	309.2	309.2	307.2	307.7
2841.265		246.0	1.913	307.2	306.6	306.3	307.0	306.8	306.6	312.2	312.2	309.2	309.2	309.2	308.2	307.2
2940.027		244.8	1.934	305.8	306.4	305.3	307.1	306.7	307.0	312.2	312.2	308.7	308.7	309.2	308.7	308.7
3039.082		239.5	1.954	305.2	305.1	305.7	305.9	305.4	304.8	311.2	311.2	310.2	310.2	310.2	309.2	310.2
3139.003		227.5	1.967	304.9	304.9	305.3	306.0	306.3	305.5	311.2	311.2	309.7	309.2	309.2	307.7	307.7
32	***	***	1.974	304.9	304.2	303.8	305.4	305.9	306.7	310.2	310.2	308.2	308.2	308.2	307.2	307.2
33	***	***	1.977	304.8	304.3	304.6	305.9	306.1	306.4	310.2	310.2	308.2	308.2	307.2	307.2	306.2
34	***	***	1.979	304.2	303.5	304.0	305.0	305.6	306.0	310.2	309.2	307.7	307.2	307.2	306.2	306.2
35	***	***	1.980	303.6	303.5	303.5	305.2	305.2	304.9	309.2	309.2	307.2	307.2	306.2	305.2	305.2
36	***	***	1.981	303.8	303.5	303.9	304.7	304.6	304.5	309.2	309.2	306.7	306.2	306.2	304.2	305.2
37	***	***	1.981	303.8	303.3	303.9	304.5	304.8	304.9	308.2	308.2	306.2	306.2	307.2	304.2	305.2
38	***	***	1.980	304.1	303.6	303.8	304.5	304.4	304.2	308.2	307.2	305.2	306.2	306.7	305.2	305.2
39	***	***	1.980	304.0	303.4	302.8	303.3	303.0	303.4	308.2	306.2	305.2	306.2	305.2	304.2	304.2
44	***	***	1.976	302.7	302.2	301.8	302.4	302.6	302.0	306.2	305.2	304.2	304.2	304.2	303.2	304.2
49	***	***	1.974	301.6	301.5	301.5	302.7	302.2	301.8	304.2	304.2	303.2	303.2	304.2	302.7	304.2
54	***	***	1.971	301.5	301.4	301.5	302.4	302.3	301.8	303.2	303.2	303.2	303.2	303.2	300.2	303.2
59	***	***	1.970	301.0	300.8	300.6	301.8	302.1	302.0	303.2	302.2	301.2	303.2	303.2	301.2	303.2
64	***	***	1.968	301.1	301.0	300.9	301.4	301.0	300.8	303.2	302.2	301.7	302.2	302.2	299.2	302.2
69	***	***	1.966	300.3	299.7	299.5	300.2	300.4	299.9	302.2	302.2	301.7	301.2	301.2	298.7	301.2
74	***	***	1.965	300.2	299.4	299.2	299.5	299.5	299.2	301.2	301.2	302.2	301.2	301.2	300.2	301.2
79	***	***	1.964	299.9	299.4	299.5	300.0	300.0	299.7	301.2	300.2	301.2	301.2	301.2	300.2	301.2
84	***	***	1.962	299.5	299.0	299.2	300.0	300.0	299.9	301.2	300.2	301.2	301.2	301.2	299.2	301.2
89	***	***	1.961	299.0	298.7	299.0	299.8	300.2	299.7	300.2	300.2	301.2	301.2	301.2	299.2	300.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 14A — Scaling Run 242: Cluttered 324–m³ Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	•••	•••	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	292.2
-4	•••	•••	1.006	292.4	291.8	291.7	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	292.2
-3	•••	•••	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	292.2
-2	•••	•••	1.006	292.4	291.8	291.8	292.4	292.2	292.3	292.2	292.2	293.2	293.2	293.2	293.2	292.2
-1	•••	•••	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	292.2
085.925		330.8	1.008	293.2	292.4	292.1	292.8	292.9	293.2	292.7	292.7	293.2	293.2	293.2	293.2	292.7
185.442		287.1	1.047	298.2	296.9	294.6	295.7	297.1	298.6	294.2	294.2	294.2	294.2	295.2	294.2	294.2
282.793		277.9	1.101	301.4	300.6	300.3	300.9	301.4	301.8	296.7	297.2	298.2	297.2	298.2	297.2	297.2
380.306		271.6	1.152	304.5	303.5	303.1	303.8	304.1	304.4	299.2	300.2	301.2	300.2	301.2	300.2	300.2
477.905		267.3	1.199	305.9	304.9	304.7	305.4	305.5	306.4	301.2	302.7	304.2	303.7	303.7	301.7	302.7
575.476		267.5	1.245	307.4	307.0	306.8	307.2	307.6	307.9	305.2	305.2	305.2	305.2	305.2	304.2	305.2
673.830		266.0	1.274	308.1	307.8	307.0	307.9	308.1	309.2	307.2	307.2	307.2	307.2	307.2	305.2	306.2
771.442		265.9	1.315	308.4	307.7	308.0	308.0	308.0	308.3	309.2	309.2	309.7	308.7	309.7	308.2	308.2
869.143		265.3	1.355	308.8	308.9	308.6	310.0	310.6	311.3	310.2	310.2	310.2	310.2	311.2	309.2	310.2
967.000		263.4	1.393	310.2	310.2	310.7	311.9	311.6	310.7	311.2	311.2	310.2	310.7	310.7	309.2	310.2
1064.871		262.6	1.430	311.1	310.5	310.0	310.9	310.5	311.1	311.2	311.2	311.2	311.2	311.2	309.2	310.2
1162.861		261.7	1.466	311.8	310.8	310.9	311.3	311.3	311.7	313.2	311.7	311.2	312.2	312.2	310.2	311.2
1260.864		261.2	1.500	311.2	310.8	310.6	310.4	310.2	310.8	315.2	312.2	312.2	312.2	313.2	310.2	311.2
1358.932		260.5	1.533	311.0	310.4	309.9	311.1	311.2	311.4	315.2	314.2	312.7	313.2	313.2	311.2	312.2
1457.156		259.5	1.564	311.7	310.4	310.9	310.9	310.9	313.0	316.2	315.2	313.2	313.2	313.2	311.2	312.2
1556.034		259.1	1.585	311.9	310.8	311.1	311.6	311.5	310.9	315.2	314.2	313.2	313.2	313.2	311.2	312.2
1654.228		258.5	1.615	312.4	311.8	311.9	312.2	312.3	312.4	315.2	314.7	312.7	312.2	312.7	310.2	312.2
1752.578		257.1	1.644	312.3	311.9	311.9	312.6	312.5	311.9	315.2	314.2	313.2	313.2	315.2	311.2	313.2
1851.031		256.8	1.673	312.9	312.3	311.8	312.8	312.3	312.7	315.2	314.2	313.2	313.2	314.2	311.2	313.2
1949.558		256.0	1.701	312.4	312.1	312.3	312.3	312.0	312.2	315.2	315.2	313.2	313.2	314.2	312.2	313.2
2048.051		255.5	1.727	311.9	311.6	311.2	311.3	311.0	311.3	315.7	315.2	313.2	312.7	314.2	312.2	312.2
2146.585		254.5	1.753	311.1	310.6	310.9	310.9	310.5	310.4	316.2	315.2	313.2	313.2	314.2	312.2	313.2
2245.578		254.4	1.769	310.4	310.2	310.8	311.6	312.2	313.2	315.2	315.2	314.2	313.2	314.2	313.2	312.2
2344.088		253.6	1.794	309.8	309.9	310.4	311.9	313.1	313.8	315.2	314.2	312.7	312.2	312.2	310.7	311.2
2442.388		253.0	1.818	310.3	311.0	310.9	312.2	312.4	312.8	315.2	314.2	312.2	312.2	312.2	309.2	311.2
2540.296		252.5	1.841	312.0	311.7	311.6	312.3	312.4	312.7	315.7	313.7	312.7	313.2	312.7	310.2	311.7
2636.898		251.8	1.864	311.7	311.3	311.5	311.7	312.6	313.1	316.2	315.2	312.2	313.2	313.2	309.2	310.2
2741.524		250.7	1.886	312.7	312.6	312.7	312.6	312.8	312.5	316.2	315.7	311.7	312.7	313.2	309.7	310.7
2840.558		250.4	1.907	310.9	311.2	311.5	311.1	310.6	310.4	316.2	316.2	312.2	312.2	313.2	310.2	310.2
2939.823		249.6	1.921	309.8	309.3	309.1	309.8	309.6	309.8	315.2	316.2	312.2	312.2	312.2	309.2	310.2
3038.942		242.9	1.940	309.6	309.4	309.8	309.9	309.9	310.1	315.2	315.7	312.2	312.2	312.2	310.2	310.7
3130.925		230.0	1.954	309.3	308.7	308.8	309.8	310.0	310.0	315.2	314.2	311.2	311.2	311.2	310.2	311.2
32	•••	•••	1.961	309.3	309.5	310.2	310.4	309.8	309.4	313.7	314.2	310.7	311.2	311.2	309.7	311.2
33	•••	•••	1.965	308.3	309.0	309.8	310.1	309.7	309.9	314.2	313.2	310.2	311.2	311.2	310.2	311.2
34	•••	•••	1.967	308.1	308.1	308.9	309.7	309.5	309.1	314.2	313.2	310.2	311.2	311.7	309.2	310.7
35	•••	•••	1.968	308.3	307.9	308.1	308.9	308.5	308.4	313.2	313.2	309.2	310.2	311.2	309.2	310.2
36	•••	•••	1.968	308.1	307.6	307.6	308.1	308.1	308.4	313.2	313.2	309.2	310.2	310.2	308.2	309.2
37	•••	•••	1.968	308.0	307.5	307.4	308.1	308.1	308.2	312.2	311.7	309.2	309.2	309.2	306.7	308.2
38	•••	•••	1.968	308.0	307.5	307.5	308.1	307.8	308.0	312.2	311.2	308.2	309.2	309.2	307.2	307.2
39	•••	•••	1.967	308.2	307.5	306.9	307.7	307.3	307.1	310.7	310.7	308.2	308.2	309.2	306.7	307.7
44	•••	•••	1.964	306.6	306.1	305.9	305.9	305.7	305.8	309.2	309.2	307.2	306.7	306.7	305.2	306.2
49	•••	•••	1.961	305.2	305.0	304.8	305.0	304.5	304.4	306.2	308.2	307.2	307.2	307.2	304.2	305.2
54	•••	•••	1.959	305.1	304.3	303.2	303.2	303.3	303.9	306.2	306.2	307.2	307.2	306.2	304.2	304.2
59	•••	•••	1.957	303.9	303.5	303.5	303.6	303.8	303.9	305.2	305.2	306.2	306.2	306.2	304.2	305.2
64	•••	•••	1.955	303.3	303.0	303.1	303.7	303.7	303.6	305.2	304.2	306.2	305.2	305.2	304.2	305.2
69	•••	•••	1.954	303.5	302.9	302.7	303.3	303.2	303.5	305.2	305.2	305.2	305.2	305.2	304.2	305.2
74	•••	•••	1.952	303.1	302.8	302.7	303.2	303.4	303.5	305.2	304.2	305.2	305.2	305.2	304.2	304.7
79	•••	•••	1.951	303.5	303.0	303.0	303.1	303.1	303.5	304.2	304.2	305.2	305.2	304.2	302.2	304.2
84	•••	•••	1.950	303.8	302.7	302.7	302.5	303.1	303.3	304.2	304.2	305.2	304.2	304.2	302.2	304.2
89	•••	•••	1.949	303.5	302.7	302.5	302.7	302.9	303.0	303.2	303.2	304.2	304.2	304.2	302.2	304.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.678
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 15A — Scaling Run 243: Cluttered 324–m³ Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	1.000	289.0	288.4	288.5	289.1	288.9	289.0	290.2	290.2	291.2	291.2	291.2	290.2	290.2
-4	***	***	1.000	289.0	288.5	288.5	289.0	288.9	289.0	290.2	290.2	291.2	291.2	291.2	290.2	290.2
-3	***	***	1.000	289.0	288.5	288.5	289.0	288.9	288.9	290.2	290.2	291.2	291.2	291.2	290.2	290.2
-2	***	***	1.000	289.0	288.5	288.5	289.1	288.9	288.9	290.2	290.2	291.2	291.2	291.2	290.2	290.2
-1	***	***	1.000	289.0	288.5	288.5	289.1	288.9	288.9	290.2	290.2	291.2	291.2	291.2	290.2	290.2
0	99.020	289.2	1.000	289.1	288.5	288.6	289.0	288.9	289.1	290.2	290.2	291.2	291.2	291.2	290.7	290.2
1	91.272	280.9	1.028	293.0	291.7	290.5	291.7	292.4	293.3	291.2	291.2	291.2	291.2	292.2	291.2	291.2
2	88.255	275.7	1.082	297.2	296.4	296.3	296.7	297.3	297.4	294.2	294.2	294.7	294.7	295.7	294.2	294.7
3	85.667	266.6	1.134	300.1	299.2	298.9	299.7	300.3	300.7	297.2	297.2	298.2	298.2	299.2	297.2	297.2
4	83.207	262.6	1.182	302.4	301.0	301.0	302.0	302.2	302.2	298.7	299.7	300.2	301.2	301.2	299.7	300.2
5	80.796	261.4	1.228	303.3	302.5	301.7	302.7	303.2	303.9	302.2	302.2	303.2	302.2	303.2	301.2	302.2
6	78.354	260.8	1.271	304.5	304.0	303.9	304.5	305.0	305.4	303.2	304.7	304.2	304.7	305.2	302.7	303.7
7	76.020	259.2	1.313	306.6	305.5	305.8	305.8	305.9	306.8	306.2	306.2	306.2	306.2	307.2	305.2	305.2
8	73.607	259.4	1.353	305.3	305.5	306.2	306.3	306.1	306.2	307.7	306.7	307.7	307.7	308.2	305.7	306.7
9	71.503	259.2	1.391	306.5	305.5	305.7	306.3	306.0	307.1	308.2	307.2	309.2	309.2	309.2	307.2	308.2
10	70.102	257.6	1.416	306.0	305.2	305.0	305.9	305.8	306.5	309.2	309.2	309.2	309.2	310.2	308.2	308.2
11	67.929	257.1	1.452	307.1	306.1	305.7	306.3	307.0	307.4	309.7	310.2	310.7	310.7	310.7	308.7	309.2
12	65.939	256.5	1.487	308.7	308.3	308.0	308.8	308.8	309.1	311.2	310.2	311.2	311.2	311.2	308.2	309.2
13	63.990	255.8	1.521	308.8	307.5	307.7	308.1	307.4	306.9	311.7	309.7	310.2	310.2	310.7	308.7	309.2
14	62.136	254.2	1.553	308.1	307.5	307.6	307.4	307.1	308.0	312.2	311.2	311.2	310.2	311.2	310.2	309.2
15	60.301	253.8	1.584	307.6	307.0	306.2	308.0	308.6	308.5	312.7	311.7	311.2	310.2	310.2	308.2	308.7
16	58.667	253.5	1.614	306.3	307.9	308.1	310.2	309.7	310.2	314.2	313.2	311.2	310.2	311.2	309.2	309.2
17	57.585	252.4	1.634	306.8	307.1	307.8	309.2	309.2	309.3	314.2	313.2	310.2	310.2	310.2	309.2	309.2
18	55.966	251.0	1.662	307.3	306.4	307.2	310.0	308.3	309.3	314.2	312.7	310.2	310.2	310.2	307.7	308.7
19	54.422	250.5	1.690	307.9	307.3	307.4	308.6	307.6	307.0	313.2	313.2	310.2	310.2	310.2	308.2	309.2
20	52.949	249.9	1.717	308.0	307.2	307.4	307.8	306.8	307.0	314.2	312.2	310.2	310.7	311.2	307.2	308.7
21	51.558	248.9	1.743	308.3	307.3	306.8	308.0	308.2	308.3	314.2	312.2	310.2	310.2	310.2	308.2	309.2
22	50.211	249.9	1.769	308.9	308.5	308.8	308.9	308.7	308.8	315.2	312.7	311.2	310.7	310.7	309.2	309.7
23	48.905	248.1	1.794	307.5	306.9	308.3	308.2	308.0	307.9	315.2	312.2	311.2	311.2	310.2	309.2	309.2
24	48.082	247.6	1.810	306.3	306.6	307.1	308.2	308.2	308.0	314.2	313.2	310.2	310.2	310.2	308.2	309.2
25	46.833	246.7	1.833	306.0	305.9	307.1	308.6	308.3	308.3	313.7	312.7	310.2	310.2	310.2	308.7	308.7
26	45.646	246.6	1.856	306.4	306.4	307.1	308.2	308.5	308.8	313.2	312.2	310.2	310.2	310.2	308.2	308.2
27	44.524	245.5	1.879	307.1	307.2	308.1	308.0	308.0	308.5	312.7	313.2	309.7	310.2	309.7	306.7	308.2
28	43.435	244.8	1.901	307.3	306.8	306.6	307.5	306.6	307.1	313.2	314.2	309.2	310.2	310.2	306.2	308.2
29	42.405	242.5	1.922	307.2	306.9	307.4	307.7	307.6	308.2	312.2	312.7	309.7	310.2	310.2	306.7	307.7
30	41.505	234.5	1.939	305.7	305.4	305.9	306.4	306.3	307.0	313.2	313.2	309.2	310.2	310.2	308.2	308.2
31	40.048	221.3	1.946	305.8	305.5	306.5	306.6	306.2	306.5	313.2	314.2	309.2	310.2	309.2	308.2	309.2
32	***	***	1.952	305.8	305.5	305.2	305.9	305.7	305.7	312.7	312.7	308.7	308.7	308.7	307.7	308.2
33	***	***	1.955	305.8	305.2	305.3	305.8	305.5	305.3	312.2	311.2	308.2	308.2	308.2	307.2	308.2
34	***	***	1.957	305.2	304.6	304.8	305.4	305.1	305.2	311.2	310.2	307.7	308.2	308.2	306.2	308.2
35	***	***	1.957	304.7	304.4	304.5	305.2	304.9	305.1	311.2	310.2	307.2	308.2	308.2	305.2	307.2
36	***	***	1.957	304.8	304.4	304.5	305.0	304.7	304.9	310.7	310.2	306.7	307.2	307.2	304.7	305.7
37	***	***	1.957	304.7	304.0	304.4	304.6	304.4	304.6	310.2	310.2	306.2	306.2	306.2	305.2	305.2
38	***	***	1.956	304.9	304.0	304.1	304.5	304.4	304.5	309.2	310.2	306.2	306.2	306.2	305.2	305.7
39	***	***	1.956	304.7	303.9	303.9	304.5	304.3	304.3	309.2	310.2	306.2	306.2	306.2	304.2	305.2
44	***	***	1.953	302.9	302.7	303.1	303.6	303.5	303.3	308.2	308.2	305.2	306.2	305.2	304.2	305.2
49	***	***	1.950	302.7	301.8	302.6	302.6	302.9	302.8	306.2	306.2	305.2	305.2	305.2	303.2	304.2
54	***	***	1.948	301.7	301.2	301.0	301.2	302.0	301.9	305.2	305.2	303.2	303.2	303.2	301.2	303.2
59	***	***	1.946	300.9	300.2	300.6	300.9	[illegible]	301.7	304.2	303.2	303.2	302.2	302.2	301.2	302.2
64	***	***	1.944	300.2	299.8	300.0	300.2	300.0	299.8	303.2	303.2	303.2	302.7	302.2	301.2	302.2
69	***	***	1.942	300.4	299.5	299.5	300.2	300.0	299.9	303.2	303.2	303.2	303.2	302.2	302.2	302.2
74	***	***	1.941	301.0	300.3	300.4	300.8	300.4	300.3	302.2	302.2	303.2	303.2	302.2	301.2	302.2
79	***	***	1.940	300.2	299.9	300.1	300.3	300.4	300.6	302.2	302.2	302.2	302.2	302.2	300.2	302.2
84	***	***	1.938	300.3	299.5	299.2	299.9	300.0	300.0	301.2	301.2	301.2	302.2	301.2	300.2	301.2
89	***	***	1.937	299.6	298.8	29[illegible].0	299.7	299.7	299.9	301.2	301.2	301.2	302.2	302.2	301.2	301.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 16A — Scaling Run 244: Cluttered 324–m^3 Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	***	***	.993	290.4	290.1	290.2	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2
-4	***	***	.993	290.4	290.1	290.2	290.5	290.4	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2
-3	***	***	.993	290.4	290.1	290.1	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2
-2	***	***	.993	290.4	290.1	290.2	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2
-1	***	***	.993	290.4	290.1	290.2	290.4	290.4	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2
0	97.224	291.0	.994	290.6	290.1	290.1	290.5	290.4	290.5	291.2	291.2	291.2	291.2	291.2	291.2	291.2
1	90.918	304.6	1.023	294.4	293.3	292.1	293.0	293.7	294.2	292.2	292.2	292.2	292.2	292.2	292.2	292.2
2	87.906	277.7	1.077	298.7	298.1	297.8	298.0	298.6	299.2	295.2	295.2	295.2	295.2	295.7	294.7	295.2
3	85.537	269.6	1.129	301.4	300.9	300.9	301.2	301.7	302.0	298.2	298.2	299.2	298.2	299.2	297.2	298.2
4	83.068	266.1	1.177	303.9	303.3	302.7	303.1	303.5	303.8	300.2	299.7	301.2	300.7	301.7	300.2	301.2
5	80.607	266.1	1.222	304.8	304.5	304.1	304.7	304.8	305.2	303.2	302.2	303.2	303.2	304.2	302.2	303.2
6	78.279	263.0	1.265	305.3	305.4	305.4	305.6	306.0	306.0	305.7	303.7	305.2	305.7	305.2	304.2	304.2
7	75.925	262.5	1.307	307.7	307.2	306.8	307.3	307.1	308.1	307.2	306.2	307.2	307.2	307.2	305.2	305.2
8	73.670	261.5	1.347	308.5	308.0	308.0	308.1	307.8	308.5	309.2	308.7	308.7	308.7	308.7	307.7	307.2
9	71.442	261.0	1.385	308.4	307.7	308.0	308.5	308.5	309.3	311.2	309.2	310.2	309.2	309.2	307.2	308.2
10	70.075	260.5	1.409	309.4	308.7	308.8	309.5	310.0	309.7	311.2	309.2	310.2	310.2	310.2	307.2	308.2
11	67.963	259.2	1.445	308.8	309.0	309.5	309.3	308.8	307.5	312.7	311.2	310.2	310.2	310.7	308.7	308.7
12	65.939	258.5	1.480	309.5	309.2	308.8	309.4	309.3	308.5	313.2	312.2	311.2	311.2	312.2	310.2	310.2
13	64.037	257.8	1.513	309.7	310.4	310.3	310.4	310.2	309.4	313.7	311.2	311.7	311.2	311.2	309.7	310.2
14	62.211	25[illegible].6	1.545	310.6	310.5	310.6	310.4	310.2	310.6	313.2	311.2	312.2	312.2	312.2	311.2	311.2
15	60.391	256.0	1.576	309.9	309.4	310.0	310.6	310.4	310.8	314.2	313.2	311.7	312.2	311.2	309.7	310.2
16	58.707	256.5	1.606	310.4	309.5	309.5	310.0	309.4	309.3	314.2	313.2	311.2	311.2	311.2	309.2	310.2
17	57.071	254.9	1.634	309.4	309.0	309.0	309.5	308.8	308.6	314.7	314.2	312.2	311.7	311.7	310.2	310.7
18	55.531	254.2	1.663	309.3	309.1	309.0	309.3	309.7	311.0	316.2	314.2	312.2	312.2	312.2	310.2	311.2
19	54.469	253.0	1.681	308.7	308.8	309.7	310.0	310.6	311.2	316.2	315.2	312.2	313.2	312.2	310.2	310.2
20	53.010	252.6	1.708	310.1	309.8	309.1	310.2	311.1	311.7	316.2	313.2	312.2	312.2	311.7	309.2	310.2
21	51.633	251.4	1.734	310.4	309.5	310.2	310.2	310.0	310.2	315.2	313.2	312.2	311.2	311.2	309.2	309.2
22	50.276	251.4	1.760	310.7	310.2	310.2	310.2	309.7	310.8	315.2	313.2	312.2	311.7	311.7	309.2	310.2
23	48.959	251.3	1.784	311.0	310.4	310.5	310.2	310.4	310.7	316.2	313.2	312.2	312.2	312.2	310.2	310.2
24	47.697	250.5	1.808	311.6	310.9	310.6	310.4	311.0	311.7	316.2	313.2	310.7	311.7	312.2	310.7	311.2
25	46.503	249.7	1.831	312.2	312.3	311.6	312.0	312.2	312.0	316.2	313.2	311.2	312.2	312.2	310.2	311.2
26	45.728	248.7	1.847	310.8	310.3	310.5	310.3	309.8	308.3	315.2	314.2	312.2	312.2	313.2	311.2	312.2
27	44.602	248.2	1.869	309.6	309.8	309.0	309.4	308.5	307.9	314.7	313.2	312.2	312.2	312.2	311.7	312.2
28	43.483	247.6	1.890	308.7	308.5	308.1	308.5	308.0	307.6	313.2	312.2	311.2	312.2	311.2	311.2	311.2
29	42.405	247.3	1.911	308.9	308.5	307.5	307.8	307.4	308.0	313.2	312.7	311.2	312.2	312.2	311.2	311.2
30	41.429	244.5	1.931	309.1	308.7	308.8	308.0	308.5	308.9	313.2	312.2	311.2	311.2	312.2	311.2	311.2
31	41.279	233.1	1.942	309.2	308.8	309.1	308.9	308.7	309.0	313.2	312.2	310.2	311.2	312.2	311.2	311.2
32	41.289	222.2	1.952	309.3	309.4	308.6	308.9	308.8	308.7	313.2	311.2	310.2	310.7	311.2	310.7	310.7
33	***	***	1.958	309.5	309.3	309.3	309.2	308.8	308.7	313.2	310.2	310.2	310.2	310.2	309.2	310.2
34	***	***	1.960	308.4	308.2	308.5	308.9	308.5	308.1	312.2	310.2	310.2	310.2	310.2	309.2	309.7
35	***	***	1.961	306.6	307.5	308.1	308.2	307.8	307.5	312.2	310.2	309.2	309.2	309.2	308.2	308.2
36	***	***	1.962	306.4	307.3	307.7	308.0	307.5	307.4	311.2	309.7	308.2	308.2	308.7	307.2	308.2
37	***	***	1.962	306.6	306.6	307.0	307.6	307.1	307.0	311.2	310.2	308.2	308.2	309.2	307.2	308.2
38	***	***	1.962	305.7	306.4	307.3	307.5	306.8	307.0	310.2	309.2	307.7	307.7	308.2	306.2	307.7
39	***	***	1.961	306.0	306.2	306.3	306.7	306.6	306.5	310.2	309.2	307.2	307.2	308.2	306.2	307.2
40	***	***	1.960	306.1	306.0	306.1	306.4	306.2	306.1	310.2	309.2	307.2	307.2	307.2	306.2	307.2
45	***	***	1.957	305.7	305.3	304.9	305.0	304.9	304.2	308.2	307.7	306.2	306.2	306.2	305.2	306.2
50	***	***	1.954	303.0	302.6	302.6	302.7	303.2	303.3	307.2	306.2	304.2	305.2	305.2	303.7	305.2
55	***	***	1.952	302.4	301.9	301.9	302.0	302.3	302.4	306.2	305.7	304.2	304.7	304.2	303.2	304.7
60	***	***	1.950	302.0	301.4	301.5	301.6	302.1	301.8	305.2	305.2	304.2	304.2	303.2	301.2	303.2
65	***	***	1.949	302.4	301.9	302.2	302.0	302.0	301.8	304.2	304.2	304.2	303.2	302.2	301.2	302.2
70	***	***	1.947	302.3	302.0	302.1	302.1	302.2	302.2	303.2	303.2	303.2	303.2	302.2	301.2	302.2
75	***	***	1.946	302.3	301.5	302.0	302.0	302.0	302.0	303.2	303.2	303.2	302.7	302.2	301.2	302.2
80	***	***	1.944	302.3	301.7	301.6	301.5	301.8	301.8	303.2	302.7	303.2	303.2	303.2	301.2	302.7
85	***	***	1.943	302.3	301.5	301.5	301.5	301.8	301.5	303.2	302.2	303.2	303.2	303.2	302.2	303.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.606

Table 17A — Scaling Run 245: Cluttered 324–m^3 Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations I: 1	2	3	4	5	6	7	8	9	10	11	12	13
-5	***	***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	299.2
-4	***	***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	299.2
-3	***	***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	299.2
-2	***	***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	299.2
-1	***	***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	299.2
096.378		337.2	1.006	298.8	298.2	298.1	298.6	298.6	298.7	300.2	299.2	300.2	300.2	300.2	300.2	299.2
189.605		297.5	1.037	303.8	302.7	301.5	302.4	303.1	303.8	300.2	300.2	301.2	301.2	301.2	300.2	300.2
286.714		285.6	1.093	308.2	307.3	307.2	308.0	308.5	308.4	303.2	302.7	304.7	304.7	304.7	303.7	303.2
384.136		280.7	1.146	310.8	310.0	309.4	309.6	310.2	310.2	306.2	306.2	308.2	308.2	308.2	307.2	306.2
481.660		276.3	1.195	312.4	312.0	311.5	311.8	312.2	312.9	308.7	308.7	311.2	311.7	311.2	309.7	308.7
579.582		275.0	1.233	314.5	313.1	314.3	313.8	313.8	313.5	311.0	310.5	313.2	313.5	313.2	311.0	310.5
676.650		273.2	1.286	315.6	315.0	314.4	314.7	315.2	315.2	314.2	312.7	315.7	315.7	315.7	312.7	312.7
774.150		272.3	1.329	316.5	315.9	316.2	316.3	316.7	316.8	315.2	314.2	317.2	317.2	317.2	315.2	314.2
872.503		270.6	1.356	316.5	316.1	316.7	316.5	315.9	315.6	316.2	315.2	317.2	318.2	318.2	316.2	316.2
970.136		270.2	1.396	316.2	316.0	316.6	316.9	316.9	316.8	317.7	316.7	318.7	318.2	318.2	317.2	316.7
1067.789		269.7	1.434	317.0	316.5	316.9	317.0	316.9	316.9	321.2	318.2	319.2	319.2	318.2	316.2	316.2
1165.497		269.2	1.471	318.5	317.7	317.3	317.8	318.1	317.8	323.2	318.2	320.7	320.7	320.7	316.7	316.7
1263.136		266.8	1.506	318.7	318.1	318.0	317.9	318.2	318.5	323.2	319.2	321.2	321.2	321.2	319.2	319.2
1360.663		266.9	1.540	318.7	318.2	318.7	319.5	319.2	319.2	325.2	321.2	322.7	322.2	321.7	319.2	318.2
1458.265		266.2	1.573	319.4	319.0	319.3	319.6	319.1	318.0	324.2	321.2	322.2	322.2	321.2	318.2	318.2
1556.782		265.3	1.594	318.0	317.8	318.9	319.2	318.7	318.4	325.2	321.2	322.2	322.2	322.2	319.2	319.2
1653.755		264.2	1.635	316.8	317.3	318.1	318.6	319.2	319.5	323.2	322.2	322.2	322.2	322.2	320.2	319.2
1752.347		263.9	1.655	317.4	317.0	318.2	319.1	319.5	320.3	324.2	323.2	322.2	323.2	323.2	320.2	320.2
1849.854		262.5	1.685	318.3	318.1	318.5	319.3	320.0	319.7	326.7	324.2	321.2	322.7	323.7	321.2	319.2
1947.327		261.7	1.713	319.8	319.4	319.7	319.4	319.9	319.6	327.2	324.2	322.2	323.2	324.2	322.2	321.2
2043.881		261.7	1.741	319.0	319.9	319.3	319.2	318.1	317.1	327.2	325.7	324.2	323.2	322.2	320.2	320.2
2132.517		260.6	1.767	318.3	317.9	317.9	318.2	317.8	317.7	327.2	327.2	326.2	325.2	323.2	321.2	321.2
2241.000		259.8	1.784	318.1	317.7	317.3	317.8	317.6	317.3	328.2	327.2	325.2	324.2	322.2	321.2	321.2
2338.969		259.9	1.810	317.3	317.3	318.5	318.2	317.8	317.8	328.7	327.2	324.2	324.2	322.7	321.2	321.2
2435.844		258.8	1.834	317.8	318.1	317.9	318.6	318.6	319.0	327.2	326.2	324.2	324.2	323.2	321.2	319.2
2531.388		257.6	1.858	318.2	318.0	318.5	318.8	317.5	317.3	326.2	325.2	325.2	324.2	324.2	321.7	319.7
2630.116		257.2	1.881	318.0	317.8	317.9	318.4	318.0	319.0	326.2	324.2	324.2	323.2	324.2	322.2	320.2
2726.942		256.4	1.903	317.6	318.6	318.7	319.4	319.8	320.9	325.7	324.2	324.7	323.2	322.2	320.7	320.7
2831.449		255.3	1.924	315.6	315.6	316.6	317.4	319.0	318.8	324.2	324.2	325.2	323.2	322.2	319.2	319.2
2933.585		247.8	1.938	316.0	316.3	317.3	317.8	317.5	317.4	325.2	325.2	325.2	324.2	322.2	319.2	318.2
3032.861		234.1	1.953	316.4	315.2	316.0	318.0	317.8	317.7	323.7	323.7	323.2	322.7	320.7	318.2	317.7
31	***	***	1.962	315.3	315.4	316.0	316.9	316.5	316.9	325.2	323.2	320.2	320.2	319.2	317.2	317.2
32	***	***	1.966	315.4	314.9	315.1	316.3	316.5	315.9	322.7	321.7	319.7	319.7	319.2	317.2	318.2
33	***	***	1.968	315.3	314.6	314.7	315.6	315.4	315.3	321.2	320.2	319.2	319.2	318.2	317.2	317.2
34	***	***	1.969	315.1	314.7	314.5	315.3	315.1	315.2	319.7	319.7	318.7	318.2	318.7	317.2	317.2
35	***	***	1.969	314.7	314.3	314.4	314.9	314.7	314.6	320.2	319.2	318.2	319.2	319.2	317.2	316.2
36	***	***	1.969	314.3	313.8	314.3	314.6	314.4	314.5	319.2	318.2	318.2	318.2	318.2	316.7	315.7
37	***	***	1.969	314.4	313.8	313.5	314.5	314.4	314.3	319.2	318.2	318.2	318.2	318.2	316.2	316.2
38	***	***	1.968	314.3	313.8	313.1	314.1	314.0	313.4	319.2	318.2	318.2	318.2	318.2	316.2	316.2
43	***	***	1.964	312.3	311.7	311.8	312.4	312.3	312.2	317.7	316.2	316.2	316.2	316.2	313.7	314.7
48	***	***	1.961	312.0	310.9	311.1	311.1	311.3	310.8	316.2	313.7	316.2	315.5	314.7	311.5	312.0
53	***	***	1.959	311.6	310.7	310.1	310.0	310.2	310.0	315.2	313.2	313.2	314.2	314.2	312.2	311.2
58	***	***	1.956	310.7	310.3	310.2	309.8	311.0	310.4	314.2	312.2	313.2	313.2	313.2	312.2	311.2
63	***	***	1.955	310.5	309.6	309.9	309.8	310.1	310.0	313.2	312.2	312.2	313.2	313.2	312.2	312.2
68	***	***	1.953	310.0	309.6	309.9	310.0	310.2	309.6	312.2	311.2	313.2	313.2	313.2	311.2	311.2
73	***	***	1.951	310.2	309.5	309.5	309.7	309.8	309.5	312.2	311.2	313.2	313.2	312.2	310.2	311.2
78	***	***	1.950	310.2	309.6	309.5	309.7	309.8	309.5	312.2	311.2	312.2	312.2	312.2	310.2	310.2
83	***	***	1.949	310.2	309.7	309.7	309.8	309.9	309.6	312.2	311.2	312.2	312.2	312.2	311.2	310.2
88	***	***	1.947	310.5	310.0	310.0	310.2	310.0	309.9	312.2	310.2	312.2	311.2	312.2	311.2	310.2
98	***	***	1.945	310.6	309.8	309.6	309.4	310.2	310.1	311.2	310.2	311.2	312.2	312.2	311.2	310.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 18A — Scaling Run 246: Cluttered 324–m^3 Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	***	***	1.005	289.0	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2
-4	***	***	1.005	289.0	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2
-3	***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2
-2	***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2
-1	***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2
	092.412	290.4	1.005	289.1	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.7	290.2	289.2
	185.361	299.6	1.031	292.9	291.6	290.5	291.3	291.7	292.1	290.2	290.2	291.2	291.2	291.2	291.2	290.2
	283.119	275.0	1.085	297.1	295.9	294.7	295.6	296.3	296.7	293.2	292.7	294.7	294.2	294.7	293.7	293.2
	380.884	268.4	1.136	299.8	298.7	298.5	299.2	300.0	299.9	296.2	296.2	298.2	298.2	298.2	297.2	296.2
	478.684	264.9	1.183	302.2	301.2	301.1	301.5	301.7	301.5	299.7	297.7	300.2	300.7	301.2	299.2	298.2
	576.537	262.9	1.228	303.1	302.4	302.1	302.4	303.0	303.5	301.2	300.2	302.2	303.2	303.2	301.2	300.2
	674.330	263.1	1.270	304.9	304.0	304.0	304.2	304.2	304.2	303.7	302.2	304.7	304.7	304.7	302.2	302.2
	772.156	261.1	1.312	305.1	304.4	304.8	305.3	305.7	305.4	305.2	304.2	306.2	306.2	307.2	304.2	303.2
	870.654	261.7	1.351	305.1	304.5	304.6	305.2	305.7	305.3	306.2	305.7	307.7	307.7	307.2	305.2	304.7
	967.959	259.8	1.389	305.4	305.4	305.2	306.1	306.4	306.4	308.2	307.2	308.2	308.2	308.2	305.2	305.2
	1065.918	258.5	1.425	305.2	305.3	305.7	307.1	307.1	307.5	310.7	308.2	309.2	309.2	309.2	306.2	306.2
	1164.048	258.2	1.460	306.8	306.3	306.8	307.4	307.8	308.4	311.2	310.2	309.2	309.2	309.2	307.2	307.2
	1262.748	257.7	1.482	307.9	307.0	306.7	307.7	308.5	309.4	313.2	313.2	310.2	310.2	310.2	308.2	308.2
	1360.946	256.7	1.515	309.4	308.7	308.5	308.9	309.5	310.0	313.2	312.7	310.7	310.2	310.2	308.7	308.7
	1459.177	255.6	1.547	308.7	307.7	307.8	308.7	308.7	308.9	315.2	313.2	311.2	311.2	311.2	310.2	309.2
	1557.531	255.1	1.578	308.5	307.6	307.1	308.0	307.9	307.6	314.7	314.2	311.7	311.2	311.2	309.7	309.2
	1655.918	254.3	1.608	307.7	306.7	307.1	307.6	307.0	306.8	314.2	313.2	311.2	311.2	311.2	309.2	309.2
	1754.388	254.0	1.636	307.4	307.0	306.8	307.9	307.3	306.8	314.7	313.2	311.2	310.7	310.2	308.7	308.2
	1852.891	253.4	1.664	307.8	307.2	306.8	307.8	308.1	308.0	314.2	312.2	311.2	311.2	310.2	309.2	309.2
	1951.939	252.6	1.682	308.0	307.8	308.1	308.2	308.5	308.0	313.2	312.2	311.2	311.2	311.2	309.2	308.2
	2050.531	251.5	1.709	309.3	308.3	308.6	308.9	309.1	309.2	314.2	312.2	312.2	312.2	312.2	309.7	309.2
	2149.218	250.4	1.735	308.4	308.8	309.2	308.8	309.3	309.1	315.2	313.2	312.2	312.2	311.2	310.2	309.2
	2247.952	250.4	1.760	307.8	308.7	309.5	309.5	308.1	307.4	315.7	312.2	312.2	311.7	311.2	309.7	309.2
	2346.721	249.3	1.784	307.3	306.8	307.2	307.4	307.0	306.9	315.2	315.2	312.2	312.2	310.2	309.2	310.2
	2445.551	248.3	1.807	306.6	306.4	306.4	307.1	306.8	306.6	316.7	314.2	312.2	312.2	310.7	309.2	310.2
	2544.374	247.9	1.830	307.0	306.8	307.3	307.7	307.8	307.5	318.2	315.2	312.2	311.2	310.2	309.2	309.2
	2643.646	247.5	1.845	306.5	305.9	306.1	306.3	306.7	308.1	318.2	314.2	311.2	310.2	310.2	308.2	308.2
	2742.575	246.9	1.860	307.9	307.0	306.8	307.1	307.1	306.6	317.7	314.2	311.7	311.7	311.7	308.2	308.7
	2841.537	246.4	1.889	308.5	307.7	307.7	307.5	307.9	308.0	317.2	314.2	311.2	311.2	312.2	310.2	309.2
	2940.541	245.1	1.910	305.5	305.7	306.6	307.5	307.1	305.3	315.7	312.7	312.2	311.7	311.7	310.2	308.7
	3039.558	244.0	1.930	306.4	306.0	306.1	306.8	306.8	306.6	315.2	313.2	311.2	311.2	312.2	310.2	308.2
	3139.119	234.6	1.947	305.5	305.2	306.2	306.5	306.7	305.4	315.2	312.7	311.7	311.2	311.7	310.2	308.7
	3239.061	223.2	1.957	304.5	304.9	305.1	305.7	305.6	305.5	315.2	311.2	310.2	310.2	311.2	310.2	308.2
33	***	***	1.961	304.9	304.5	304.9	305.5	306.1	305.7	313.2	310.2	309.2	309.2	310.2	309.2	308.2
34	***	***	1.964	304.5	304.0	304.3	304.8	304.8	304.9	313.2	310.7	309.7	309.2	309.2	307.7	307.7
35	***	***	1.966	303.8	303.6	304.0	304.7	304.6	305.2	312.2	310.2	309.2	308.2	308.2	307.2	307.2
36	***	***	1.967	303.9	303.4	303.6	304.2	304.1	304.9	311.2	310.2	308.2	308.2	307.7	306.2	306.2
37	***	***	1.967	303.5	303.1	303.1	303.7	303.9	303.9	311.2	309.2	308.2	307.2	307.2	305.2	305.2
38	***	***	1.967	303.8	303.1	303.0	303.3	303.2	303.3	309.7	309.2	307.2	307.2	306.7	304.7	304.7
39	***	***	1.966	303.8	303.1	302.9	303.0	303.1	303.1	309.2	309.2	307.2	306.2	306.2	303.2	304.2
40	***	***	1.966	303.7	303.1	303.5	303.4	303.6	303.9	308.7	308.2	306.2	306.2	305.7	303.2	304.2
45	***	***	1.963	302.3	302.2	301.8	303.0	303.1	302.7	306.2	305.7	304.2	305.2	304.7	302.2	303.2
50	***	***	1.960	300.4	300.0	300.1	300.3	300.9	300.4	304.2	304.2	304.2	305.2	303.7	301.2	302.2
55	***	***	1.958	300.2	299.4	299.4	299.5	300.2	300.2	304.2	304.2	303.2	303.2	303.2	301.2	302.2
60	***	***	1.956	300.4	299.9	299.8	300.0	299.9	299.7	304.2	303.2	303.2	303.2	302.2	301.2	302.2
65	***	***	1.954	300.9	300.4	300.3	300.4	300.2	299.9	303.2	302.2	303.2	303.2	302.2	299.2	301.2
70	***	***	1.953	300.6	300.6	300.2	300.7	300.4	300.3	302.2	301.7	303.2	302.2	301.7	299.2	301.2
75	***	***	1.951	300.2	300.0	299.9	300.0	300.5	300.3	302.2	301.2	302.2	302.2	301.2	298.7	300.2
80	***	***	1.950	300.0	299.7	299.7	299.8	299.7	300.2	302.2	301.2	302.2	302.2	301.2	299.2	300.2
85	***	***	1.949	299.9	299.7	299.7	299.7	299.6	299.7	302.2	301.2	302.2	302.2	301.2	300.2	300.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.606

Table 19A — Scaling Run 247: Cluttered 324–m^3 Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T_s (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.5	292.2	291.2	293.2	293.2	292.2	292.2	292.2
-4	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2
-3	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2
-2	***	***	1.000	291.9	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2
-1	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2
0	98.306	311.3	1.000	292.1	291.5	291.3	291.8	291.9	292.0	292.2	291.2	293.2	293.2	292.7	292.2	292.2
1	90.068	291.9	1.016	295.0	293.8	293.0	293.8	294.4	295.0	292.2	292.2	293.2	293.2	293.2	292.2	292.2
2	88.240	285.5	1.073	299.0	297.8	297.1	296.6	297.6	298.3	294.7	294.2	296.2	295.7	296.7	295.2	295.2
3	85.694	275.7	1.126	302.5	301.6	301.0	301.3	302.0	302.3	296.2	297.2	300.2	300.2	301.2	299.2	298.2
4	83.221	272.0	1.175	305.1	304.2	303.6	304.2	304.8	305.1	300.7	299.7	302.2	302.7	302.7	301.2	300.7
5	80.748	268.3	1.221	306.1	305.7	305.8	306.1	306.4	306.5	303.2	302.2	303.2	304.2	304.2	303.2	303.2
6	78.367	267.6	1.266	306.8	306.8	306.6	307.5	308.5	308.1	304.7	304.7	306.2	306.2	306.7	305.7	304.7
7	75.993	265.4	1.308	307.9	307.1	306.9	308.4	309.8	308.1	307.2	306.2	308.2	308.2	308.2	307.2	306.2
8	74.449	265.6	1.335	309.0	308.5	308.8	309.3	309.8	309.5	308.2	307.2	309.2	308.2	309.2	307.2	307.2
9	72.197	264.9	1.374	311.0	310.1	310.2	310.6	311.0	311.2	310.2	308.7	310.2	310.2	310.7	307.7	307.7
10	69.973	263.1	1.412	310.2	309.6	309.0	309.4	309.6	309.5	312.2	310.2	312.2	312.2	312.2	309.2	309.2
11	67.939	262.5	1.449	309.5	309.2	309.2	310.1	310.8	312.0	312.7	311.2	312.7	312.2	311.2	309.7	309.2
12	65.864	261.2	1.483	309.7	309.3	310.4	310.2	311.2	310.3	314.2	311.2	312.2	313.2	312.2	309.2	309.2
13	63.929	261.1	1.517	309.7	308.8	310.0	310.7	312.8	311.7	316.2	313.7	313.7	313.7	314.2	311.2	311.7
14	62.048	260.4	1.550	311.2	310.7	310.7	311.2	312.0	312.0	317.2	315.2	313.2	314.2	314.2	313.2	313.2
15	60.258	259.5	1.582	314.0	312.8	312.6	311.6	311.4	311.5	318.7	316.7	314.7	314.7	313.7	311.7	311.7
16	58.524	258.3	1.613	310.7	309.7	310.0	311.2	311.0	312.0	321.2	317.2	315.2	314.2	314.2	311.2	310.2
17	57.361	257.9	1.632	310.4	310.2	310.3	311.4	313.1	314.2	321.2	316.2	315.2	315.2	314.2	310.2	310.2
18	55.799	257.0	1.661	311.6	311.2	310.2	312.7	314.1	314.0	321.2	318.2	315.2	315.2	314.7	311.2	311.2
19	54.231	256.1	1.689	310.8	311.1	311.4	311.8	311.5	311.5	321.2	320.2	316.2	315.2	316.2	314.2	314.2
20	52.772	255.7	1.717	312.0	311.7	312.4	312.0	311.5	311.3	321.7	317.2	314.7	314.7	314.2	312.7	312.2
21	51.333	254.7	1.743	312.4	311.3	310.9	311.2	310.9	311.2	320.2	315.2	314.2	313.2	312.2	311.2	311.2
22	49.959	254.5	1.769	311.6	311.2	310.9	311.3	311.6	311.3	320.7	315.7	314.2	313.2	312.7	310.7	310.7
23	48.653	253.5	1.794	309.7	310.0	309.5	310.6	310.1	310.2	321.2	315.2	314.2	313.2	313.2	310.2	311.2
24	47.789	252.9	1.810	310.9	310.8	310.2	310.9	310.7	311.0	320.2	315.2	313.2	313.2	313.2	312.2	312.2
25	46.548	252.2	1.834	309.5	309.4	309.4	310.1	309.5	309.0	320.2	316.7	314.2	314.2	314.2	312.7	313.2
26	45.354	251.4	1.857	309.7	308.9	308.5	310.2	310.2	309.5	320.2	318.2	315.2	315.2	316.2	314.2	313.2
27	44.224	251.2	1.880	310.2	309.5	309.6	309.7	310.0	310.0	319.7	318.7	315.7	314.7	314.7	313.2	312.7
28	43.116	250.2	1.902	311.6	311.0	310.9	310.7	310.9	310.3	320.2	317.2	315.2	314.2	314.2	313.2	311.2
29	42.408	249.7	1.917	311.7	311.7	311.3	311.2	311.9	312.1	320.2	317.2	314.2	314.2	313.2	312.2	311.2
30	41.592	244.6	1.937	311.0	310.5	310.5	311.2	310.9	309.4	319.2	317.2	314.2	313.7	312.7	310.7	309.7
31	40.755	231.2	1.952	310.7	310.4	310.6	310.3	308.8	309.1	320.2	315.2	314.2	313.2	312.2	310.2	309.2
32	***	***	1.960	310.5	310.2	309.6	309.3	308.5	308.7	317.2	314.2	313.2	312.2	312.2	309.7	309.7
33	***	***	1.964	309.8	309.4	309.3	309.2	308.7	308.5	314.2	313.2	312.2	312.2	311.2	310.2	310.2
34	***	***	1.966	309.0	308.7	308.8	308.8	308.4	308.1	313.2	312.7	312.2	312.7	310.7	309.2	310.2
35	***	***	1.967	308.6	308.3	308.3	308.5	308.4	308.2	313.2	312.2	312.2	312.2	311.2	309.2	309.2
36	***	***	1.968	308.3	308.1	308.1	308.3	308.2	308.1	313.2	312.2	312.2	311.2	311.2	309.2	308.2
37	***	***	1.968	308.0	307.6	307.9	308.1	307.9	307.8	312.7	311.7	310.7	311.2	311.2	309.2	309.2
38	***	***	1.967	308.0	307.7	307.7	308.0	307.6	307.6	311.2	310.2	310.2	310.2	310.2	309.2	308.2
39	***	***	1.966	307.5	307.5	307.6	307.6	307.5	307.2	311.2	311.2	309.7	309.7	310.2	308.7	308.2
44	***	***	1.963	306.7	306.7	306.8	307.2	306.7	306.1	308.7	309.2	306.7	306.7	306.7	304.7	306.2
49	***	***	1.960	305.4	305.2	304.6	305.4	[illegible]	305.1	307.2	307.2	305.2	306.2	306.2	303.2	305.2
54	***	***	1.958	304.2	303.4	303.2	303.8	[illegible]	303.3	307.2	306.2	306.2	306.2	306.2	303.2	305.2
59	***	***	1.956	303.4	302.9	302.8	302.9	303.3	303.0	306.2	305.2	305.2	305.2	304.2	301.2	304.2
64	***	***	1.954	303.1	302.7	302.9	302.9	[illegible]	302.8	306.2	304.2	305.2	305.2	305.2	302.2	303.2
69	***	***	1.953	303.1	302.6	302.7	303.1	[illegible]	302.9	305.2	304.2	305.2	305.2	305.2	303.2	304.2
74	***	***	1.951	303.2	302.7	302.7	303.1	303.1	302.9	305.2	304.2	304.7	304.2	304.2	303.2	304.2
79	***	***	1.950	303.5	302.9	302.8	303.1	303.0	302.5	304.2	304.2	304.2	304.2	304.2	302.2	303.2
84	***	***	1.949	303.9	303.1	303.1	303.0	302.7	302.5	304.2	303.2	304.2	304.2	304.2	302.2	303.2
89	***	***	1.947	303.8	303.3	303.0	303.1	302.5	302.1	304.2	303.2	304.2	304.2	304.2	302.2	303.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

Table 20A — Scaling Run 248: Cluttered 324−m^3 Chamber, South 3.279-cm Nozzle

Time t (s)	Press Cyl P (atm)	T (K)	Chamber P (atm)	1	2	3	4	5	6	7	8	9	10	11	12	13
				Chamber Absolute Temperatures (K) at Locations I												
-5	***	***	.996	295.7	295.2	295.2	295.6	295.5	295.4	296.2	295.2	296.2	296.2	296.2	296.2	295.2
-4	***	***	.996	295.7	295.2	295.2	295.6	295.5	295.4	296.2	295.2	296.2	296.2	296.2	296.2	295.2
-3	***	***	.996	295.7	295.2	295.2	295.6	295.5	295.4	296.2	295.2	296.2	296.2	296.2	296.2	295.2
-2	***	***	.996	295.7	295.2	295.2	295.6	295.5	295.4	296.2	295.2	296.2	296.2	296.2	296.2	295.2
-1	***	***	.996	295.7	295.2	295.2	295.6	295.5	295.4	296.2	295.2	296.2	296.2	296.2	296.2	295.2
098.190		331.1	.996	296.4	295.6	295.2	295.7	295.9	296.2	296.2	295.2	296.2	296.2	296.2	296.2	295.2
100.690		288.8	1.026	303.1	302.3	301.3	302.0	302.9	303.1	296.7	296.2	297.2	297.2	297.2	296.7	296.2
287.878		281.7	1.082	305.1	304.5	304.2	304.4	305.1	305.1	299.2	298.2	301.2	301.2	302.2	300.2	300.2
385.395		277.8	1.134	306.7	305.9	305.9	306.1	307.0	307.1	301.7	301.7	303.7	304.2	304.2	302.7	302.7
482.871		273.9	1.182	309.5	308.6	308.4	308.7	309.3	309.3	304.2	304.2	306.2	306.2	306.2	305.2	305.2
580.452		271.8	1.228	310.5	309.5	309.5	309.6	309.8	310.2	307.2	306.2	308.7	309.2	309.2	306.7	308.2
677.932		271.0	1.272	311.6	310.9	310.4	311.3	311.7	311.6	309.2	308.2	310.2	311.2	312.2	310.2	311.2
775.684		269.5	1.313	312.2	311.8	311.5	312.3	313.0	313.0	311.7	310.7	312.7	313.2	313.7	312.7	312.2
873.293		268.9	1.354	312.9	312.9	313.5	314.2	314.6	314.2	313.2	311.2	313.2	314.2	314.2	314.2	313.2
971.810		268.0	1.380	313.6	313.5	313.8	314.4	314.9	314.7	314.2	313.2	314.2	314.2	315.2	313.2	314.2
1069.619		267.0	1.417	314.3	314.0	314.0	314.5	315.2	315.1	314.7	314.7	315.7	315.7	314.7	313.7	313.7
1167.476		266.0	1.454	314.9	315.2	314.7	314.9	314.3	314.2	317.2	316.2	316.2	316.2	316.2	314.2	313.2
1265.442		265.1	1.488	315.2	314.0	313.9	314.7	314.6	315.1	316.7	315.7	316.2	316.7	317.2	314.7	314.7
1363.510		264.8	1.522	314.6	314.3	314.5	315.1	315.6	315.4	318.2	316.2	316.2	317.2	317.2	315.2	315.2
1461.650		263.6	1.554	315.2	314.5	313.8	314.4	314.9	314.7	318.7	316.7	317.2	317.2	316.2	314.2	314.2
1559.830		262.6	1.586	315.1	314.9	314.0	314.2	313.6	315.2	320.2	317.2	318.2	318.2	317.2	314.2	315.2
1658.673		261.8	1.606	316.1	315.6	315.4	315.5	315.5	315.6	320.2	316.2	318.2	317.2	316.2	315.2	315.2
1757.910		261.7	1.636	315.2	316.4	316.6	316.7	316.7	317.2	320.2	317.7	318.2	317.2	317.2	315.7	316.2
1855.381		260.8	1.665	315.8	315.4	315.2	315.4	315.0	315.7	321.2	318.2	320.2	317.2	317.2	315.2	315.2
1953.850		260.6	1.692	315.2	314.6	314.1	313.8	313.2	314.2	322.7	319.7	318.7	317.7	316.7	315.7	316.2
2052.395		259.3	1.719	314.7	313.8	313.8	313.1	312.8	313.1	324.2	321.2	320.2	319.2	318.2	317.2	318.2
2150.963		258.8	1.745	315.0	314.2	313.8	314.0	314.0	314.7	323.2	320.2	319.2	318.7	318.2	318.2	317.7
2249.626		257.8	1.771	315.8	315.6	315.5	315.1	315.2	315.8	322.2	319.2	319.2	318.2	319.2	318.2	317.2
2348.735		257.6	1.788	316.1	315.2	315.1	315.1	314.5	315.1	321.2	319.2	318.2	319.2	317.2	316.2	315.2
2447.469		256.8	1.812	315.2	314.5	316.5	315.5	315.3	314.6	320.7	319.2	318.7	318.7	318.7	317.2	317.2
2546.218		255.6	1.835	314.6	314.5	314.4	315.1	314.6	314.6	319.2	319.2	319.2	318.2	318.2	318.2	317.2
2645.071		255.3	1.858	314.6	314.2	314.6	315.2	315.2	315.3	320.2	319.2	319.7	318.7	319.7	318.2	316.2
2743.932		254.0	1.880	314.4	313.6	313.4	313.8	313.6	314.0	320.2	319.2	318.2	318.2	319.2	318.2	316.2
2843.177		254.2	1.894	312.0	312.3	312.8	313.4	314.0	314.6	321.2	319.2	318.2	318.2	319.2	317.2	315.2
2942.102		253.8	1.915	312.9	313.6	314.4	314.6	315.2	315.4	321.7	319.2	318.2	318.2	317.7	316.2	314.7
3041.102		248.6	1.936	312.7	312.3	313.5	313.7	313.8	314.1	322.2	319.2	318.2	318.2	318.2	316.2	316.2
3140.544		240.1	1.952	312.9	312.3	312.4	312.2	313.2	313.1	321.2	318.2	318.2	317.7	317.7	315.2	315.2
3240.782		235.5	1.964	313.1	312.6	312.7	313.0	312.3	312.0	321.2	318.2	318.2	317.2	317.2	316.2	316.2
33	***	***	1.970	313.3	312.5	312.6	312.7	312.5	311.9	321.2	317.7	316.7	316.2	316.2	315.7	315.2
34	***	***	1.973	313.0	312.3	312.5	312.8	312.8	312.6	321.2	317.2	316.2	316.2	315.2	315.2	314.2
35	***	***	1.974	312.0	311.9	312.0	311.8	312.0	312.2	319.2	317.2	316.2	316.2	315.2	314.2	314.2
36	***	***	1.975	311.9	311.6	311.5	311.5	311.8	312.2	319.2	316.7	315.7	315.2	315.2	313.7	313.2
37	***	***	1.975	310.8	310.6	310.7	311.4	311.8	312.3	318.2	315.2	314.2	315.2	314.2	313.2	313.2
38	***	***	1.974	310.7	310.4	310.9	312.0	311.9	312.1	317.2	315.2	314.2	314.2	314.2	313.2	312.7
39	***	***	1.974	310.9	310.5	311.1	311.6	311.6	311.8	316.2	315.2	314.2	313.2	313.2	312.2	312.2
40	***	***	1.973	310.9	310.7	310.8	311.5	311.2	311.6	316.2	315.2	314.2	313.2	313.2	312.2	312.2
45	***	***	1.970	310.2	309.9	309.3	310.2	310.0	309.5	313.7	312.2	312.7	312.7	312.7	311.2	311.2
50	***	***	1.967	308.4	308.0	307.8	307.8	308.0	307.6	312.2	310.2	310.7	311.7	311.2	310.2	310.2
55	***	***	1.965	308.1	307.3	307.6	307.0	306.9	307.1	311.2	310.2	309.2	311.2	310.2	309.2	309.2
60	***	***	1.963	307.5	307.2	307.2	307.3	307.5	306.7	310.2	309.2	309.2	309.2	309.2	308.2	308.2
65	***	***	1.962	307.3	306.9	306.6	306.8	307.0	306.9	309.2	308.2	308.2	308.2	308.2	306.2	307.2
70	***	***	1.960	306.8	306.2	306.6	307.0	306.8	307.0	308.2	307.2	308.2	308.2	307.2	305.2	307.2
75	***	***	1.958	307.0	306.1	305.9	306.4	307.1	307.0	308.2	306.2	308.2	308.2	307.2	305.2	306.2
80	***	***	1.957	306.7	306.6	306.1	306.2	306.3	306.7	307.2	306.2	308.2	308.2	308.2	306.2	307.2
85	***	***	1.956	306.7	306.4	305.9	306.2	306.2	306.2	307.2	306.2	307.2	307.2	307.2	306.2	307.2

COORDINATES

I	R (M)	THETA (DEG)	Z (M)
1	0.000	00	-0.586
2	0.000	00	-0.293
3	0.000	00	0.000
4	0.000	00	0.293
5	0.000	00	0.586
6	0.000	00	0.878
7	0.000	00	2.049
8	0.000	00	2.342
9	0.000	00	2.635
10	0.000	00	2.928
11	0.000	00	3.220
12	0.000	00	3.513
13	0.000	00	3.806

B-Tables

Tables 2B to 20B, called B-tables, present the pressurant mole fraction histories as inferred from the *I*-location temperature histories from the A-tables. The basis of this data reduction program (see Appendix B) is the transient thermodynamic analysis by Corlett et al. [2]. Reference 5 gives this analysis in more detail.

In addition to pressurant concentrations at each *I*-location corresponding to those in the matching A-tables, values of the mean pressurant concentration $\bar{X}$ are given. These values represent theoretical perfect mixing; they are determined from the known amount of resident gas initially in the chamber and the estimated amount of pressurant gas injected during any given time interval. Further, in the first six columns of the table, variables are given, respectively, as follows:

(1) time t in seconds,

(2) mean temperature of chamber contents $\bar{T}$ in °C,

(3) mean temperature of resident air $\bar{T}_a$ in °C,

(4) mean temperature of pressurant gas $\bar{T}_p$ in °C,

(5) dimensionless parameter-characterizing molar heat-transfer coefficient β, and

(6) the ratio β/θ, where θ is a characteristic time in seconds.

Table 2B — Inferred Pressurant Distribution, Scaling Run 230; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	16.1	16.1	15.9	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	21.9	24.9	-7.4	9.5	.9170	.092	.102	.095	.071	.077	.083	.117	.102	.117	.086	.086	.102	.086	.071
VALVE FULLY OPEN																			
2.0	25.5	31.4	-4.3	6.1	.5091	.165	.187	.179	.142	.159	.173	.195	.134	.176	.176	.162	.176	.148	.134
3.0	27.7	36.3	-2.1	5.7	.4124	.223	.251	.248	.204	.230	.248	.290	.175	.214	.214	.188	.227	.214	.201
4.0	29.1	40.0	-.4	5.7	.3489	.269	.319	.289	.264	.282	.304	.331	.232	.257	.257	.232	.257	.245	.232
5.0	30.5	43.7	.5	3.6	.1882	.307	.357	.338	.306	.329	.359	.382	.234	.292	.292	.269	.280	.269	.280
6.0	31.1	46.3	1.2	4.7	.2232	.339	.391	.352	.325	.354	.383	.409	.283	.338	.327	.305	.338	.305	.294
7.0	31.0	47.9	1.9	6.4	.2801	.367	.410	.389	.354	.384	.413	.434	.310	.343	.343	.343	.376	.343	.332
8.0	31.2	49.3	2.0	3.9	.0967	.383	.421	.404	.378	.400	.429	.450	.332	.385	.364	.342	.374	.342	.353
COMMENCE VALVE CLOSURE																			
9.0	31.3	51.1	2.0	4.3	.1525	.404	.444	.426	.408	.418	.444	.471	.347	.398	.387	.357	.398	.377	.377
10.0	31.0	52.3	2.0	1.7	.1673	.423	.469	.444	.416	.438	.471	.495	.372	.422	.422	.382	.412	.382	.377
VALVE FULLY CLOSED																			
11.0	30.1	52.9	.8	1.4	.1464	.437	.478	.461	.428	.451	.480	.499	.399	.428	.428	.409	.418	.409	.399
12.0	31.6	56.2	.1	-2.6	-.2610	.437	.480	.467	.439	.458	.483	.505	.392	.419	.419	.401	.428	.401	.392
13.0	31.5	55.9	.1	.2	.0249	.437	.488	.475	.450	.465	.488	.510	.391	.427	.409	.391	.418	.391	.382
14.0	31.2	55.2	.3	.5	.0506	.437	.488	.472	.446	.461	.492	.508	.397	.425	.425	.388	.416	.388	.379
15.0	30.9	54.5	.4	.5	.0517	.437	.487	.471	.447	.465	.495	.513	.393	.421	.421	.402	.412	.384	.375
16.0	30.7	54.2	.5	.3	.0262	.437	.493	.479	.449	.467	.493	.519	.387	.415	.415	.397	.406	.378	.387
17.0	30.6	53.9	.6	.3	.0265	.437	.501	.477	.450	.469	.495	.516	.381	.409	.409	.390	.418	.390	.381
18.0	30.3	53.2	.7	.5	.0539	.437	.494	.473	.443	.460	.490	.523	.389	.418	.418	.389	.409	.389	.389
19.0	30.1	52.9	.8	.3	.0274	.437	.500	.475	.448	.467	.490	.523	.400	.410	.410	.391	.400	.391	.381
20.0	29.9	52.5	.9	.3	.0277	.437	.502	.477	.458	.479	.497	.516	.375	.404	.404	.384	.413	.384	.394
21.0	29.8	52.2	1.0	.3	.0280	.437	.505	.483	.458	.479	.497	.512	.374	.403	.403	.383	.413	.383	.393
22.0	29.6	51.8	1.1	.3	.0283	.437	.504	.480	.453	.474	.492	.510	.378	.417	.407	.378	.407	.388	.398
23.0	29.5	51.5	1.2	.3	.0286	.437	.504	.482	.456	.472	.490	.514	.387	.417	.397	.377	.407	.397	.387
24.0	29.3	51.2	1.2	.3	.0290	.437	.508	.484	.454	.466	.486	.504	.382	.412	.402	.392	.412	.402	.382
25.0	29.2	50.8	1.3	.3	.0293	.437	.505	.483	.451	.465	.477	.503	.380	.431	.410	.390	.400	.390	.400
26.0	29.0	50.5	1.4	.3	.0296	.437	.500	.482	.443	.458	.472	.507	.401	.431	.431	.390	.401	.390	.380
27.0	28.9	50.1	1.5	.3	.0300	.437	.503	.485	.450	.464	.476	.503	.396	.427	.407	.386	.417	.386	.386
28.0	28.7	49.8	1.6	.3	.0304	.437	.503	.472	.441	.461	.482	.507	.391	.422	.401	.401	.412	.401	.391
29.0	28.7	49.8	1.6	0.0	0.0000	.437	.499	.472	.441	.464	.486	.515	.391	.422	.422	.401	.412	.391	.370
30.0	28.6	49.5	1.7	.3	.0308	.437	.499	.473	.444	.465	.492	.515	.388	.419	.419	.398	.409	.377	.388
31.0	28.4	49.1	1.8	.3	.0311	.437	.497	.472	.445	.466	.497	.514	.386	.417	.417	.386	.407	.396	.386
32.0	28.2	48.8	1.8	.3	.0315	.437	.497	.478	.450	.471	.501	.522	.386	.418	.397	.375	.407	.397	.386
33.0	28.2	48.8	1.8	0.0	0.0000	.437	.499	.476	.448	.472	.506	.531	.384	.416	.395	.374	.406	.395	.384
34.0	28.1	48.4	1.9	.3	.0319	.437	.504	.482	.452	.473	.506	.523	.383	.415	.394	.372	.405	.394	.383

Table 3B — Inferred Pressurant Distribution, Scaling Run 231; Three 3.279-cm Nozzles

							Pressurant Fractions (X) at Locations I												
t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	13.5	13.5	38.7	1.7	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	18.3	18.5	13.4	-.6	-.0255	.043	-.494	-.299	-.025	-.201	-.338	-.299	.385	.190	.190	.385	.190	.483	.385
VALVE FULLY OPEN																			
2.0	23.5	25.7	8.9	5.1	.4921	.131	-.000	-.000	-.000	.006	.006	.101	.279	.190	.190	.279	.220	.250	.190
3.0	27.5	32.5	7.5	2.0	.1588	.199	.135	.131	.127	.147	.135	.179	.279	.279	.239	.279	.239	.219	.199
4.0	29.6	37.5	6.3	3.7	.2589	.253	.218	.202	.205	.221	.212	.228	.288	.288	.304	.288	.272	.288	.277
5.0	31.1	41.9	5.4	3.5	.2116	.296	.268	.268	.276	.271	.271	.306	.312	.284	.312	.339	.339	.325	.284
6.0	31.9	45.8	4.1	3.8	.2083	.333	.307	.324	.317	.331	.331	.353	.343	.343	.343	.343	.331	.343	.319
7.0	32.0	48.9	2.6	5.0	.2451	.365	.346	.355	.344	.350	.357	.389	.376	.376	.376	.376	.376	.365	.355
8.0	32.4	51.5	2.7	3.2	.1323	.390	.389	.389	.369	.375	.387	.422	.389	.389	.389	.399	.399	.399	.379
9.0	32.2	53.1	2.7	4.6	.1782	.414	.412	.402	.402	.404	.410	.436	.388	.428	.428	.428	.428	.418	.388
COMMENCE VALVE CLOSURE																			
10.0	32.1	54.6	2.7	4.1	.1397	.433	.437	.429	.423	.425	.423	.439	.425	.435	.445	.445	.454	.435	.418
11.0	31.7	55.8	2.4	3.1	.1366	.450	.443	.441	.432	.447	.458	.481	.436	.454	.454	.454	.436	.464	.494
VALVE FULLY CLOSED																			
12.0	31.0	56.9	.9	1.1	.0470	.461	.488	.460	.449	.455	.462	.480	.453	.462	.462	.462	.462	.462	.453
13.0	31.9	58.8	.6	-2.9	-.1285	.461	.475	.468	.463	.462	.468	.491	.462	.462	.462	.444	.444	.453	.444
14.0	31.6	58.1	.7	.9	.0421	.461	.464	.474	.464	.458	.472	.490	.455	.455	.455	.455	.455	.455	.446
15.0	31.3	57.5	.8	1.0	.0428	.461	.466	.473	.461	.463	.479	.500	.465	.465	.447	.447	.447	.438	.447
16.0	31.2	57.2	.8	.5	.0217	.461	.466	.466	.461	.466	.472	.500	.470	.461	.461	.443	.443	.443	.443
17.0	30.9	56.6	.9	1.0	.0440	.461	.467	.463	.456	.465	.468	.492	.459	.459	.459	.441	.459	.450	.459
18.0	30.7	56.2	.9	.5	.0223	.461	.473	.464	.455	.455	.466	.487	.471	.453	.471	.453	.453	.444	.453
19.0	30.6	55.9	1.0	.5	.0225	.461	.472	.463	.448	.452	.461	.479	.464	.464	.464	.455	.446	.464	.464
20.0	30.3	55.3	1.1	1.0	.0456	.461	.474	.465	.448	.454	.459	.474	.459	.459	.459	.459	.459	.468	.459
21.0	30.1	54.9	1.1	.5	.0231	.461	.477	.469	.456	.460	.465	.478	.456	.456	.456	.456	.456	.456	.456
22.0	29.9	54.6	1.1	.5	.0233	.461	.478	.468	.457	.467	.467	.483	.455	.455	.455	.455	.455	.446	.455
23.0	29.8	54.3	1.2	.5	.0235	.461	.473	.468	.460	.470	.466	.485	.453	.453	.453	.453	.453	.462	.453
24.0	29.6	54.0	1.2	.5	.0237	.461	.471	.467	.455	.469	.465	.484	.465	.465	.446	.446	.465	.455	.446
25.0	29.6	54.0	1.2	0.0	0.0000	.461	.469	.463	.456	.465	.469	.488	.456	.456	.456	.458	.456	.458	.456
26.0	29.5	53.7	1.3	.5	.0240	.461	.462	.460	.458	.464	.469	.490	.452	.452	.471	.452	.452	.462	.457
27.0	29.3	53.3	1.3	.5	.0242	.461	.472	.469	.463	.471	.476	.490	.455	.455	.455	.455	.446	.446	.446
28.0	29.2	53.0	1.4	.5	.0244	.461	.478	.476	.468	.474	.480	.493	.457	.457	.457	.437	.437	.447	.437
29.0	29.0	52.7	1.4	.6	.0247	.461	.479	.476	.466	.472	.483	.489	.456	.456	.456	.446	.436	.446	.436
30.0	29.0	52.6	1.5	0.0	0.0000	.461	.481	.477	.461	.469	.479	.493	.455	.455	.455	.455	.436	.446	.436
31.0	28.9	51.3	2.7	.6	.0249	.461	.483	.474	.462	.468	.474	.491	.454	.454	.454	.454	.454	.444	.433
32.0	28.7	50.1	3.8	.6	.0252	.461	.479	.475	.464	.469	.475	.494	.453	.453	.453	.453	.453	.442	.437
33.0	28.7	49.5	4.5	0.0	0.0000	.461	.478	.472	.461	.465	.472	.492	.450	.450	.450	.450	.450	.461	.450
34.0	28.6	48.5	5.3	.6	.0254	.461	.480	.473	.462	.467	.473	.494	.448	.448	.448	.448	.448	.460	.448

Table 4B — Inferred Pressurant Distribution, Scaling Run 232; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	0.7	0.7	21.1	1.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	14.1	15.1	-1.2	10.1	.6784	.065	-.049	.007	.099	.062	-.036	-.030	.148	.086	.056	.117	.086	.179	.117
VALVE FULLY OPEN																			
2.0	19.7	24.1	-5.3	1.8	.1649	.148	.093	.104	.121	.114	.097	.124	.182	.182	.182	.216	.182	.182	.148
3.0	22.8	29.7	-6.0	-.8	-.0398	.192	.148	.139	.142	.167	.153	.181	.223	.195	.195	.251	.223	.251	.223
4.0	24.4	34.3	-5.3	4.6	.3423	.249	.217	.212	.212	.222	.222	.243	.280	.268	.268	.293	.268	.280	.255
5.0	26.1	39.1	-4.7	2.7	.1707	.295	.282	.280	.259	.275	.273	.289	.305	.305	.305	.326	.305	.328	.305
6.0	26.8	42.1	-4.1	4.0	.2190	.333	.329	.316	.308	.319	.325	.338	.323	.344	.344	.344	.355	.355	.323
7.0	27.3	45.1	-3.7	3.2	.1540	.364	.375	.363	.349	.359	.355	.377	.357	.357	.357	.377	.377	.377	.357
8.0	27.1	46.8	-3.4	5.0	.2204	.392	.386	.386	.364	.376	.374	.406	.380	.390	.410	.410	.410	.420	.380
9.0	27.6	49.3	-3.3	2.3	.0865	.414	.409	.403	.394	.400	.401	.420	.392	.411	.411	.430	.430	.468	.411
COMMENCE VALVE CLOSURE																			
10.0	27.4	50.9	-3.2	3.9	.1344	.434	.435	.426	.404	.411	.424	.465	.437	.456	.437	.437	.437	.447	.419
11.0	26.8	51.9	-3.6	2.1	.1464	.452	.446	.441	.421	.441	.455	.473	.453	.472	.472	.453	.453	.453	.435
VALVE FULLY CLOSED																			
12.0	26.1	52.2	-4.7	.8	.0547	.459	.462	.444	.427	.441	.457	.478	.448	.465	.483	.483	.465	.465	.448
13.0	26.8	53.8	-5.0	-1.5	-.1068	.459	.461	.461	.442	.459	.467	.481	.455	.455	.455	.464	.455	.455	.455
14.0	26.7	53.5	-4.9	.3	.0210	.459	.467	.463	.453	.467	.479	.486	.448	.465	.465	.448	.448	.448	.431
15.0	26.4	52.9	-4.8	.6	.0425	.459	.465	.462	.455	.457	.469	.478	.445	.453	.453	.471	.462	.453	.445
16.0	26.2	52.5	-4.8	.3	.0215	.459	.468	.456	.451	.458	.472	.486	.449	.449	.449	.466	.449	.466	.449
17.0	25.9	51.9	-4.7	.6	.0436	.459	.480	.473	.454	.468	.480	.487	.445	.445	.445	.445	.445	.445	.454
18.0	25.8	51.6	-4.6	.3	.0221	.459	.473	.473	.462	.464	.471	.485	.441	.441	.441	.441	.459	.459	.459
19.0	25.5	51.0	-4.6	.6	.0448	.459	.467	.471	.460	.464	.473	.485	.449	.449	.449	.458	.440	.458	.440
20.0	25.3	50.6	-4.5	.3	.0227	.459	.463	.459	.455	.461	.468	.485	.454	.454	.454	.454	.454	.454	.454
21.0	25.2	50.3	-4.5	.3	.0229	.459	.470	.463	.450	.461	.476	.490	.467	.448	.448	.448	.448	.448	.448
22.0	25.0	50.0	-4.4	.3	.0231	.459	.476	.469	.456	.462	.476	.493	.445	.445	.445	.445	.454	.454	.445
23.0	24.9	49.7	-4.4	.3	.0234	.459	.468	.462	.455	.462	.472	.488	.457	.457	.457	.457	.438	.457	.438
24.0	24.7	49.4	-4.3	.3	.0236	.459	.470	.464	.461	.468	.479	.494	.461	.442	.442	.442	.442	.461	.442
25.0	24.6	49.0	-4.3	.3	.0238	.459	.470	.462	.457	.470	.481	.492	.445	.445	.445	.445	.445	.464	.445
26.0	24.4	48.7	-4.2	.3	.0240	.459	.468	.460	.449	.464	.479	.488	.453	.453	.453	.453	.443	.462	.443
27.0	24.3	48.4	-4.2	.4	.0243	.459	.465	.461	.446	.457	.474	.488	.459	.459	.459	.459	.440	.459	.440
28.0	24.3	48.4	-4.2	0.0	0.0000	.459	.466	.459	.449	.457	.470	.485	.457	.457	.457	.457	.457	.457	.438
29.0	24.1	48.1	-4.1	.4	.0245	.459	.470	.459	.449	.457	.468	.486	.457	.457	.457	.457	.457	.457	.438
30.0	24.0	47.7	-4.1	.4	.0247	.459	.470	.459	.451	.462	.470	.491	.455	.455	.455	.455	.455	.455	.435
31.0	23.8	47.4	-4.0	.4	.0250	.459	.471	.457	.457	.469	.477	.492	.452	.452	.452	.452	.452	.452	.432
32.0	23.8	47.4	-4.0	0.0	0.0000	.459	.476	.468	.456	.470	.476	.489	.450	.450	.450	.450	.450	.450	.431
33.0	23.7	47.1	-4.0	.4	.0252	.459	.474	.476	.461	.469	.476	.490	.457	.447	.447	.447	.447	.447	.427
34.0	23.5	46.8	-3.9	.4	.0255	.459	.475	.473	.459	.473	.479	.488	.443	.443	.443	.443	.443	.463	.443

Table 5B — Inferred Pressurant Distribution, Scaling Run 233; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	12.6	12.6	40.5	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	16.3	16.5	12.9	36.1	1.6199	.044	-.554	-.307	.130	.048	-.253	-.171	513	.240	-.034	.240	.240	.240	.240
VALVE FULLY OPEN																			
2.0	22.1	24.3	7.6	3.2	.2931	.120	.020	.038	.074	.086	.068	.158	.248	.158	.158	.218	.128	.158	.158
3.0	25.3	30.0	6.4	4.8	.4002	.198	.122	.117	.134	.151	.139	.228	.270	.228	.228	.270	.228	.228	.228
4.0	28.0	35.7	4.7	2.6	.1764	.250	.215	.212	.206	.212	.209	.257	.277	.277	.261	.293	.277	.277	.277
5.0	29.6	40.5	3.2	3.1	.1841	.293	.270	.265	.270	.268	.278	.313	.292	.292	.319	.319	.319	.319	.292
6.0	30.7	44.9	1.7	2.9	.1485	.329	.332	.323	.307	.323	.328	.355	.318	.330	.330	.341	.330	.330	.330
7.0	31.0	47.7	1.2	4.2	.1993	.360	.353	.350	.340	.361	.363	.381	.346	.346	.346	.368	.368	.389	.368
8.0	31.4	50.3	1.4	3.1	.1273	.385	.392	.384	.375	.381	.390	.408	.381	.381	.381	.392	.392	.381	.371
9.0	31.1	51.5	1.6	5.3	.2037	.409	.404	.406	.388	.404	.412	.432	.398	.418	.418	.418	.418	.398	.398
COMMENCE VALVE CLOSURE																			
10.0	31.0	53.1	1.5	4.0	.1358	.428	.420	.422	.409	.422	.434	.449	.426	.436	.436	.436	.436	.426	.416
11.0	30.7	54.3	1.4	2.9	.1331	.446	.456	.454	.431	.442	.442	.473	.448	.448	.448	.448	.448	.429	.429
VALVE FULLY CLOSED																			
12.0	29.7	54.9	.0	2.4	.1082	.458	.478	.466	.449	.453	.458	.486	.451	.460	.460	.460	.451	.451	.433
13.0	30.8	57.1	-.2	-3.3	-.1524	.458	.470	.461	.447	.457	.468	.494	.454	.454	.454	.454	.454	.454	.437
14.0	30.7	56.8	-.2	.5	.0212	.458	.466	.457	.444	.459	.474	.501	.450	.450	.450	.459	.450	.450	.450
15.0	30.4	56.1	-.1	.9	.0430	.458	.467	.456	.447	.455	.469	.497	.442	.460	.460	.460	.460	.442	.442
16.0	30.0	55.5	-.0	1.0	.0437	.458	.467	.460	.448	.458	.480	.507	.458	.458	.449	.449	.449	.431	.440
17.0	29.9	55.2	-.0	.5	.0222	.458	.474	.469	.462	.464	.480	.503	.462	.462	.444	.444	.444	.425	.425
18.0	29.6	54.5	.1	1.0	.0449	.458	.476	.470	.461	.472	.489	.509	.456	.456	.437	.437	.437	.419	.437
19.0	29.4	54.2	.1	.5	.0228	.458	.484	.478	.463	.467	.476	.502	.454	.454	.436	.454	.436	.417	.436
20.0	29.3	53.9	.2	.5	.0230	.458	.482	.464	.456	.462	.473	.512	.451	.451	.451	.451	.432	.432	.441
21.0	29.1	53.6	.2	.5	.0232	.458	.470	.459	.450	.461	.478	.508	.450	.450	.450	.450	.450	.431	.450
22.0	29.0	53.3	.3	.5	.0234	.458	.473	.463	.446	.456	.475	.503	.446	.446	.446	.437	.456	.446	.465
23.0	28.8	52.9	.3	.5	.0236	.458	.479	.463	.446	.458	.467	.496	.444	.444	.463	.444	.444	.444	.463
24.0	28.7	52.6	.3	.5	.0238	.458	.483	.467	.454	.464	.477	.502	.444	.444	.444	.444	.444	.444	.444
25.0	28.5	52.3	.4	.5	.0241	.458	.480	.464	.453	.462	.472	.505	.449	.458	.458	.439	.439	.439	.439
26.0	28.4	52.0	.4	.5	.0243	.458	.482	.470	.458	.460	.470	.499	.462	.443	.443	.443	.443	.443	.443
27.0	28.4	52.0	.4	0.0	0.0000	.458	.472	.464	.456	.462	.468	.497	.458	.439	.448	.448	.458	.439	.448
28.0	28.2	51.7	.5	.5	.0245	.458	.470	.459	.449	.457	.468	.498	.451	.451	.451	.451	.451	.451	.451
29.0	28.0	51.3	.5	.5	.0248	.458	.473	.463	.452	.457	.467	.497	.450	.450	.450	.450	.450	.450	.450
30.0	27.9	51.0	.6	.5	.0250	.458	.477	.465	.453	.455	.465	.495	.447	.447	.447	.467	.447	.447	.447
31.0	27.9	49.5	2.4	0.0	0.0000	.458	.480	.463	.448	.452	.467	.499	.454	.444	.444	.444	.454	.444	.465
32.0	27.7	48.3	3.5	.6	.0253	.458	.484	.464	.450	.453	.470	.502	.441	.441	.441	.441	.464	.441	.464
33.0	27.6	47.1	4.5	.6	.0256	.458	.487	.471	.452	.462	.473	.511	.443	.443	.443	.443	.443	.443	.443
34.0	27.6	46.6	5.1	0.0	0.0000	.458	.484	.465	.453	.460	.474	.513	.441	.441	.441	.441	.441	.441	.465

Table 6B — Inferred Pressurant Distribution, Scaling Run 234; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	9.0	9.0	21.4	1.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	14.3	15.4	-2.2	8.9	.5060	.064	.016	.010	.044	.056	.022	-.041	.136	.050	.079	.136	.079	.136	.107
VALVE FULLY OPEN																			
2.0	19.6	23.9	-5.3	3.0	.2071	.140	.097	.111	.110	.110	.111	.115	.203	.203	.169	.203	.169	.169	.135
3.0	22.6	29.3	-5.6	.2	.0114	.192	.147	.147	.141	.164	.170	.170	.239	.239	.239	.239	.210	.210	.187
4.0	24.7	34.4	-4.8	3.8	.2600	.248	.222	.220	.205	.220	.230	.240	.253	.266	.278	.278	.266	.278	.266
5.0	26.1	38.6	-4.1	3.5	.2227	.294	.286	.277	.261	.275	.284	.296	.296	.319	.296	.319	.296	.319	.296
6.0	27.0	42.2	-3.6	3.3	.1804	.331	.326	.324	.311	.315	.322	.330	.332	.354	.332	.343	.332	.354	.332
7.0	27.7	45.2	-3.2	3.1	.1434	.362	.360	.364	.339	.350	.362	.379	.356	.356	.376	.376	.356	.376	.356
8.0	27.9	47.6	-3.0	3.5	.1496	.389	.409	.405	.375	.391	.405	.405	.387	.387	.387	.387	.387	.377	.348
9.0	28.3	50.1	-3.0	2.5	.0940	.411	.430	.432	.417	.424	.428	.434	.398	.398	.398	.398	.398	.417	.379
COMMENCE VALVE CLOSURE																			
10.0	27.8	51.1	-2.9	5.1	.1794	.432	.454	.448	.428	.434	.434	.447	.419	.428	.428	.428	.428	.437	.400
11.0	27.5	52.6	-3.3	1.6	.1079	.449	.462	.462	.446	.453	.465	.474	.440	.440	.440	.440	.440	.458	.422
VALVE FULLY CLOSED																			
12.0	27.2	54.3	-4.8	-.3	-.0212	.458	.480	.468	.457	.467	.480	.489	.445	.445	.445	.445	.445	.462	.428
13.0	28.4	56.8	-5.1	-2.4	-.1623	.458	.480	.466	.450	.466	.484	.492	.438	.446	.446	.446	.446	.455	.438
14.0	28.4	56.8	-5.1	0.0	0.0000	.458	.485	.474	.461	.474	.479	.482	.438	.438	.438	.454	.438	.454	.438
15.0	28.1	56.2	-5.1	.6	.0396	.458	.482	.478	.469	.492	.491	.476	.445	.437	.437	.437	.437	.445	.429
16.0	28.0	55.8	-5.0	.3	.0200	.458	.479	.467	.462	.469	.477	.476	.451	.434	.451	.451	.451	.451	.434
17.0	27.7	55.2	-4.9	.6	.0406	.458	.484	.474	.461	.474	.474	.474	.444	.444	.444	.444	.444	.444	.444
18.0	27.5	54.9	-4.9	.3	.0206	.458	.487	.480	.467	.479	.482	.482	.442	.442	.442	.442	.442	.442	.425
19.0	27.2	54.3	-4.8	.6	.0416	.458	.481	.475	.468	.481	.490	.486	.430	.439	.439	.439	.439	.447	.439
20.0	27.1	53.9	-4.8	.3	.0211	.458	.470	.463	.463	.469	.479	.482	.435	.435	.452	.452	.452	.452	.452
21.0	27.1	53.9	-4.8	0.0	0.0000	.458	.472	.464	.452	.466	.478	.483	.432	.449	.449	.449	.449	.466	.449
22.0	26.9	53.6	-4.7	.3	.0212	.458	.474	.464	.460	.467	.479	.486	.446	.446	.446	.446	.446	.455	.438
23.0	26.7	53.3	-4.7	.3	.0214	.458	.485	.476	.464	.473	.473	.482	.445	.445	.445	.445	.445	.445	.428
24.0	26.6	53.0	-4.6	.3	.0216	.458	.487	.475	.465	.466	.473	.478	.445	.445	.445	.445	.445	.445	.437
25.0	26.4	52.7	-4.6	.3	.0218	.458	.488	.476	.459	.464	.472	.483	.445	.445	.445	.445	.445	.445	.445
26.0	26.3	52.3	-4.5	.3	.0220	.458	.490	.475	.459	.464	.471	.476	.443	.443	.443	.443	.443	.461	.443
27.0	26.1	52.0	-4.5	.3	.0222	.458	.486	.475	.457	.464	.475	.477	.443	.443	.443	.443	.443	.461	.443
28.0	26.0	51.7	-4.4	.3	.0224	.458	.483	.472	.461	.465	.474	.479	.443	.443	.443	.443	.443	.461	.443
29.0	26.0	51.7	-4.4	0.0	0.0000	.458	.480	.471	.457	.464	.476	.480	.444	.444	.444	.444	.444	.462	.444
30.0	25.8	51.4	-4.4	.3	.0226	.458	.480	.475	.460	.466	.477	.480	.443	.443	.443	.443	.443	.460	.443
31.0	25.7	51.1	-4.3	.3	.0228	.458	.485	.474	.462	.467	.478	.480	.440	.440	.440	.440	.440	.458	.449
32.0	25.7	51.1	-4.3	0.0	0.0000	.458	.482	.475	.460	.466	.480	.482	.439	.439	.439	.439	.439	.457	.457
33.0	25.5	50.7	-4.3	.3	.0230	.458	.485	.474	.460	.469	.482	.482	.438	.438	.438	.438	.438	.456	.456
34.0	25.5	50.7	-4.3	0.0	0.0000	.458	.483	.477	.461	.470	.484	.483	.437	.437	.437	.437	.437	.455	.455

Table 7B — Inferred Pressurant Distribution, Scaling Run 235; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_g$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	10.4	10.4	30.4	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	15.6	15.0	10.5	5.6	.2811	.049	-.359	-.152	.036	-.077	-.189	-.265	.450	.074	.262	.262	-.020	.356	.262
VALVE FULLY OPEN																			
2.0	21.4	24.0	5.3	2.5	.2369	.135	.049	.065	.065	.071	.049	.076	.189	.243	.243	.189	.082	.189	.243
3.0	24.5	29.5	4.6	5.0	.4097	.203	.136	.128	.132	.144	.144	.188	.204	.264	.284	.244	.204	.224	.264
4.0	26.5	34.3	4.1	4.6	.3264	.257	.204	.211	.204	.204	.201	.234	.326	.293	.293	.293	.260	.293	.326
5.0	28.6	40.1	1.6	2.3	.1316	.299	.287	.287	.279	.287	.289	.302	.315	.302	302	.302	.289	.328	.315
6.0	29.3	43.1	1.8	4.2	.2216	.335	.319	.312	.331	.339	.346	.370	.331	.331	.355	.331	.331	.331	.331
7.0	29.3	44.5	1.9	5.1	.1663	.356	.396	.351	.341	.349	.349	.370	.353	.353	.377	.353	.353	.377	.353
8.0	29.7	47.0	1.9	3.4	.1416	.383	.367	.381	.367	.369	.381	.401	.389	.401	.412	.389	.367	.389	.367
9.0	29.6	48.8	1.8	4.3	.1709	.407	.401	.403	.396	.392	.405	.415	.432	432	.432	.411	.390	.390	.390
COMMENCE VALVE CLOSURE																			
10.0	29.5	50.3	1.6	4.3	.1494	.427	.409	.411	.411	.409	.424	.442	.438	.438	.448	.428	.428	.438	.428
11.0	29.3	51.7	1.3	2.3	.1192	.445	.444	.444	.419	.428	.442	.468	.423	.462	.462	.442	.442	.462	.442
VALVE FULLY CLOSED																			
12.0	28.3	52.5	-.3	1.9	.0993	.458	.455	.457	.440	.450	.461	.476	.465	.465	.465	.446	.446	.465	.465
13.0	29.8	55.5	-.6	-4.0	-.2061	.458	.463	.465	.446	.447	.458	.487	.463	.463	.463	.446	.446	.446	.463
14.0	29.7	55.2	-.5	.4	.0199	.458	.463	.465	.455	.456	.467	.481	.462	.462	.462	.444	.444	.444	.453
15.0	29.4	54.6	-.5	.8	.0402	.458	.458	.458	.469	.461	.478	.487	.452	.452	.470	.434	.434	.452	.457
16.0	29.2	54.3	-.5	.4	.0204	.458	.473	.466	.464	.466	.482	.489	.458	.458	.458	.440	.422	.440	.440
17.0	28.9	53.7	-.4	.8	.0412	.458	.479	.481	.473	.475	.481	.484	.451	.451	.451	.433	.423	.433	.442
18.0	28.8	53.4	-.4	.4	.0209	.458	.483	.478	.472	.465	.472	.478	.450	.450	.450	.431	.431	.450	.450
19.0	28.6	53.1	-.4	.4	.0211	.458	.486	.479	.467	.465	.465	.479	.450	.450	.450	.432	.432	.450	.450
20.0	28.3	52.5	-.3	.8	.0426	.458	.484	.482	.471	.465	.463	.476	.448	.448	.448	.429	.429	.448	.467
21.0	28.1	52.2	-.3	.4	.0216	.458	.488	.481	.460	.468	.462	.477	.444	.444	.454	.444	.435	.444	.464
22.0	28.0	51.9	-.3	.4	.0218	.458	.480	.487	.457	.459	.466	.480	.461	.461	.441	.441	.422	.441	.461
23.0	27.8	51.6	-.2	.4	.0220	.458	.468	.470	.456	.464	.470	.481	.458	.458	.458	.439	.439	.439	.458
24.0	27.8	51.6	-.2	0.0	0.0000	.458	.464	.460	.453	.458	.468	.478	.456	.456	.456	.437	.437	.456	.476
25.0	27.7	51.3	-.2	.4	.0222	.458	.459	.461	.449	.455	.463	.474	.451	.470	.470	.451	.432	.451	.470
26.0	27.5	51.0	-.2	.4	.0224	.458	.457	.455	.448	.457	.463	.475	.448	.467	.467	.448	.448	.457	.467
27.0	27.4	50.7	-.2	.4	.0226	.458	.456	.458	.450	.458	.466	.477	.462	.462	.462	.442	.442	.462	.462
28.0	27.2	50.4	-.1	.4	.0228	.458	.455	.457	.447	.455	.465	.473	.459	.469	.479	.439	.439	.459	.459
29.0	27.1	50.0	-.1	.4	.0230	.458	.459	.453	.443	.451	.461	.483	.475	.475	.475	.435	.435	.455	.455
30.0	27.1	50.0	-.1	0.0	0.0000	.458	.458	.458	.450	.458	.474	.490	.464	.464	.464	.434	.434	.454	.454
31.0	26.9	49.7	-.1	.4	.0232	.458	.454	.458	.458	.466	.480	.494	.456	.456	.456	.436	.436	.456	.456
32.0	26.8	49.4	-.0	.5	.0234	.458	.452	.452	.454	.462	.475	.489	.450	.471	.471	.430	.450	.450	.450
33.0	26.8	49.4	-.0	0.0	0.0000	.458	.453	.457	.459	.469	.477	.489	.471	.461	.451	.430	.441	.451	.451
34.0	26.6	49.0	.1	.5	.0236	.458	.457	.461	.463	.469	.479	.496	.451	.451	.451	.430	.451	.451	.451

Table 8B — Inferred Pressurant Distribution, Scaling Run 236; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	17.4	17.4	23.7	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	23.1	24.2	6.9	5.1	.3260	.062	-.051	-.016	.030	.013	-.033	-.033	.157	.100	.129	.157	.100	.129	.129
VALVE FULLY OPEN																			
2.0	28.0	32.0	5.9	7.2	.7105	.151	.132	.128	.124	.139	.155	.178	.174	.174	.136	.174	.136	.136	.174
3.0	31.4	38.0	7.2	4.8	.3806	.215	.200	.213	.178	.210	.210	.226	.246	.262	.230	.230	.197	.197	.197
4.0	34.2	43.6	8.3	2.9	.1948	.267	.263	.277	.235	.260	.280	.305	.260	.260	.260	.288	.260	.260	.260
5.0	35.4	46.5	8.9	3.6	.1461	.296	.307	.302	.270	.294	.310	.334	.267	.320	.294	.294	.294	.267	.294
6.0	35.8	49.0	9.4	5.5	.3069	.334	.331	.333	.323	.336	.346	.368	.343	.331	.343	.331	.331	.305	.318
7.0	36.5	52.0	9.6	3.7	.1750	.364	.378	.376	.347	.371	.395	.402	.366	.366	.343	.366	.343	.343	.343
8.0	36.4	53.7	9.6	5.3	.2291	.392	.427	.396	.366	.382	.389	.414	.368	.391	.403	.403	.403	.380	.368
9.0	36.4	55.4	9.6	4.7	.1813	.415	.431	.429	.400	.420	.433	.470	.392	.413	.392	.413	.413	.392	.392
COMMENCE VALVE CLOSURE																			
10.0	36.6	57.4	9.4	3.2	.1079	.434	.464	.456	.418	.441	.462	.477	.427	.427	.427	.416	.416	.406	.406
11.0	36.0	58.0	9.2	2.8	.1087	.451	.483	.468	.438	.460	.470	.479	.442	.442	.442	.442	.442	.442	.421
VALVE FULLY CLOSED																			
12.0	34.9	58.2	7.7	1.4	.0953	.461	.487	.477	.451	.471	.483	.504	.451	.451	.451	.451	.451	.431	.431
13.0	35.7	59.7	7.6	-1.7	-.1096	.461	.499	.481	.451	.468	.479	.495	.447	.437	.447	.456	.447	.447	.437
14.0	35.6	59.4	7.7	.3	.0215	.461	.510	.494	.452	.465	.487	.504	.442	.442	.442	.442	.442	.442	.423
15.0	35.3	58.8	7.7	.7	.0436	.461	.513	.505	.458	.468	.485	.507	.436	.436	.436	.436	.436	.436	.436
16.0	34.9	58.2	7.7	.7	.0444	.461	.506	.496	.458	.474	.488	.504	.452	.452	.432	.432	.432	.432	.432
17.0	34.8	57.9	7.8	.3	.0225	.461	.500	.494	.460	.480	.498	.510	.446	.446	.436	.446	.426	.426	.426
18.0	34.5	57.3	7.8	.7	.0456	.461	.498	.496	.468	.484	.498	.508	.440	.440	.440	.440	.440	.419	.419
19.0	34.3	57.0	7.8	.3	.0231	.461	.502	.498	.473	.485	.498	.512	.435	.435	.435	.435	.435	.424	.424
20.0	34.0	56.3	7.9	.7	.0469	.461	.507	.499	.470	.485	.497	.507	.429	.450	.429	.429	.429	.429	.429
21.0	33.8	56.0	7.9	.4	.0238	.461	.504	.496	.479	.491	.498	.506	.446	.446	.425	.425	.425	.425	.425
22.0	33.7	55.7	7.9	.4	.0240	.461	.505	.494	.465	.480	.500	.513	.448	.448	.427	.427	.427	.427	.427
23.0	33.5	55.4	7.9	.4	.0243	.461	.494	.488	.465	.477	.494	.513	.446	.446	.446	.425	.425	.425	.446
24.0	33.4	55.1	8.0	.4	.0245	.461	.486	.482	.456	.473	.488	.512	.442	.442	.442	.442	.442	.442	.442
25.0	33.2	54.8	8.0	.4	.0247	.461	.488	.475	.456	.475	.490	.509	.436	.458	.436	.436	.458	.436	.436
26.0	33.1	54.5	8.0	.4	.0250	.461	.491	.476	.458	.476	.489	.512	.452	.452	.452	.430	.430	.430	.441
27.0	33.1	54.5	8.0	0.0	0.0000	.461	.491	.485	.467	.482	.493	.506	.450	.450	.450	.429	.429	.429	.429
28.0	32.9	54.1	8.0	.4	.0252	.461	.492	.488	.468	.490	.496	.509	.451	.451	.429	.429	.429	.429	.429
29.0	32.7	53.8	8.1	.4	.0255	.461	.492	.492	.470	.490	.503	.516	.440	.440	.429	.429	.429	.429	.429
30.0	32.7	53.8	8.1	0.0	0.0000	.461	.497	.488	.462	.488	.501	.521	.449	.449	.427	.427	.427	.427	.427
31.0	32.6	53.5	8.1	.4	.0258	.461	.500	.489	.469	.491	.504	.522	.449	.427	.427	.427	.427	.427	.427
32.0	32.4	53.2	8.1	.4	.0260	.461	.499	.492	.470	.492	.501	.519	.450	.428	.428	.428	.428	.428	.428
33.0	32.3	52.9	8.2	.4	.0263	.461	.501	.490	.477	.495	.501	.515	.430	.430	.430	.430	.430	.430	.430
34.0	32.3	52.9	8.2	0.0	0.0000	.461	.502	.493	.473	.493	.502	.509	.431	.431	.431	.431	.431	.431	.431
XXX																			

Table 9B — Inferred Pressurant Distribution, Scaling Run 237; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	7.4	7.4	35.8	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	10.9	11.6	-1.8	36.4	1.9066	.051	-.232	-.046	.742	.065	-.143	-.150	.051	-.061	-.135	-.061	.068	.311	.236
VALVE FULLY OPEN																			
2.0	15.5	18.6	-3.9	11.3	1.0988	.139	-.078	.047	.657	.078	.002	.033	.096	.051	.006	.051	.096	.541	.229
3.0	18.3	23.8	-2.4	7.9	.6480	.207	.023	.176	.684	.126	.084	.077	.126	.107	.088	.107	.241	.603	.241
4.0	20.7	28.4	-1.4	5.3	.3692	.260	.116	.254	.733	.177	.163	.197	.167	.167	.133	.133	.200	.670	.267
5.0	21.8	31.7	-.8	6.0	.3612	.303	.143	.251	.769	.245	.245	.269	.208	.208	.161	.177	.254	.716	.300
6.0	22.6	34.4	-.4	5.6	.3035	.340	.208	.294	.797	.248	.260	.297	.257	.257	.199	.199	.314	.717	.372
7.0	22.7	36.2	-.2	6.2	.2939	.370	.252	.310	.836	.296	.274	.280	.296	.269	.241	.241	.337	.762	.419
8.0	23.1	38.4	-.2	4.5	.1843	.395	.286	.367	.812	.330	.317	.369	.335	.284	.258	.258	.361	.776	.387
9.0	22.8	38.8	-.2	7.8	.2061	.411	.289	.360	.852	.342	.342	.378	.291	.342	.266	.291	.394	.603	.394
COMMENCE VALVE CLOSURE																			
10.0	22.3	39.5	-.3	7.3	.2636	.432	.318	.411	.850	.348	.368	.398	.353	.353	.315	.315	.391	.605	.391
11.0	22.3	41.0	-.5	2.5	.1394	.449	.369	.403	.841	.365	.386	.422	.398	.374	.326	.350	.446	.784	.374
VALVE FULLY CLOSED																			
12.0	21.5	42.0	-2.3	2.1	.1105	.463	.380	.491	.809	.385	.412	.414	.396	.385	.339	.339	.441	.791	.441
13.0	23.3	45.7	-2.7	-5.7	-.3069	.463	.434	.483	.568	.391	.413	.428	.434	.413	.393	.393	.455	.640	.578
14.0	23.3	45.7	-2.7	0.0	0.0000	.463	.471	.467	.512	.430	.457	.477	.432	.432	.422	.422	.453	.545	.504
15.0	23.0	45.1	-2.6	.9	.0487	.463	.489	.466	.512	.445	.479	.500	.447	.447	.426	.426	.447	.468	.468
16.0	22.8	44.8	-2.6	.5	.0247	.463	.495	.474	.514	.459	.490	.505	.444	.444	.423	.423	.444	.455	.455
17.0	22.5	44.2	-2.5	.9	.0501	.463	.492	.468	.509	.462	.498	.511	.440	.440	.419	.419	.440	.462	.462
18.0	22.4	43.9	-2.5	.5	.0254	.463	.499	.465	.506	.461	.493	.506	.439	.461	.417	.417	.439	.461	.461
19.0	22.2	43.6	-2.5	.5	.0257	.463	.501	.468	.505	.459	.488	.501	.451	.451	.429	.429	.451	.451	.440
20.0	22.1	43.2	-2.4	.5	.0260	.463	.511	.469	.504	.460	.491	.500	.447	.447	.425	.425	.447	.447	.447
21.0	21.9	42.9	-2.4	.5	.0262	.463	.505	.470	.499	.457	.485	.499	.446	.446	.424	.424	.446	.479	.446
22.0	21.8	42.6	-2.4	.5	.0265	.463	.496	.461	.496	.454	.483	.494	.461	.461	.439	.439	.439	.461	.439
23.0	21.6	42.3	-2.3	.5	.0268	.463	.492	.459	.497	.459	.483	.497	.454	.454	.432	.432	.454	.466	.443
24.0	21.5	42.0	-2.3	.5	.0271	.463	.493	.454	.504	.464	.491	.493	.448	.448	.425	.425	.448	.471	.448
25.0	21.3	41.7	-2.3	.5	.0274	.463	.492	.461	.513	.470	.488	.495	.447	.447	.424	.424	.447	.470	.447
26.0	21.2	41.4	-2.2	.5	.0277	.463	.495	.462	.504	.462	.485	.497	.449	.449	.426	.426	.449	.472	.449
27.0	21.2	41.4	-2.2	0.0	0.0000	.463	.490	.460	.501	.460	.488	.499	.446	.446	.446	.423	.446	.469	.446
28.0	21.0	41.0	-2.2	.5	.0280	.463	.496	.461	.505	.463	.491	.502	.447	.447	.424	.424	.447	.470	.447
29.0	20.9	40.7	-2.2	.5	.0283	.463	.496	.471	.505	.471	.489	.501	.445	.445	.422	.422	.445	.468	.445
30.0	20.7	40.4	-2.1	.5	.0287	.463	.496	.467	.519	.479	.496	.498	.442	.442	.418	.416	.442	.465	.442
31.0	20.7	40.4	-2.1	0.0	0.0000	.463	.492	.463	.513	.473	.499	.499	.437	.437	.437	.437	.437	.461	.437
32.0	20.5	40.1	-2.1	.5	.0290	.463	.490	.462	.509	.467	.495	.502	.436	.436	.436	.436	.448	.459	.448
33.0	20.4	39.8	-2.0	.5	.0293	.463	.492	.457	.502	.461	.492	.502	.435	.435	.435	.435	.459	.459	.459
34.0	20.4	39.8	-2.0	0.0	0.0000	.463	.498	.462	.505	.465	.489	.498	.434	.434	.434	.434	.457	.457	.457

Table 10B — Inferred Pressurant Distribution, Scaling Run 238; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	7.4	7.4	35.8	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	10.9	11.6	-1.8	36.4	1.9066	.051	-.232	-.046	.742	.065	-.143	-.150	.051	-.061	-.135	-.061	.088	.311	.236
VALVE FULLY OPEN																			
2.0	15.5	18.6	-3.9	11.3	1.0988	.139	-.078	.047	.657	.078	.002	.033	.096	.051	.006	.051	.096	.541	.229
3.0	18.3	23.8	-2.4	7.9	.6480	.207	.023	.176	.684	.126	.084	.077	.126	.107	088	.107	.241	.603	.241
4.0	20.7	28.4	-1.4	5.3	.3692	.260	116	.254	.733	.177	.163	.197	.167	.167	.133	.133	.200	.670	.267
5.0	21.8	31.7	-.8	6.0	.3612	.303	.143	.251	.769	.245	.245	.269	.208	.208	.161	.177	.254	.716	.300
6.0	22.6	34.4	-.4	5.6	.3035	.340	.208	.294	.797	.248	.260	.297	.257	.257	.199	.199	.314	.717	.372
7.0	22.7	36.2	-.2	6.2	.2939	.370	.252	.310	.836	.296	.274	.280	.296	.269	.241	.241	.337	.762	.419
8.0	23.1	38.4	-.2	4.5	.1843	.395	.286	.367	.812	.330	.317	.369	.335	.284	.258	.258	.361	.776	.387
9.0	22.8	38.8	-.2	7.8	.2061	.411	.289	.360	.852	.342	342	.378	.291	.342	.266	.291	.394	.603	.394
COMMENCE VALVE CLOSURE																			
10.0	22.3	39.5	-.3	7.3	.2636	.432	.318	.411	.850	.348	.368	.398	.353	.353	.315	.315	.391	.605	.391
11.0	22.3	41.0	-.5	2.5	.1354	.449	.369	.403	.841	.365	.386	.422	.398	.374	.326	.350	.446	.784	.374
VALVE FULLY CLOSED																			
12.0	21.5	42.0	-2.3	2.1	.1105	.463	.380	.491	.809	.385	.412	.414	.396	.385	.339	.339	.441	.791	.441
13.0	23.3	45.7	-2.7	-5.7	-.3069	.463	.434	.483	.568	.391	.413	.428	.434	.413	.393	.393	.455	.640	.578
14.0	23.3	45.7	-2.7	0.0	0.0000	.463	.471	.467	.512	.430	.457	.477	.432	.432	.422	.422	.453	.545	504
15.0	23.0	45.1	-2.6	.9	.0487	.463	.489	.466	.512	.445	.479	.500	.447	.447	.426	.426	.447	.468	.468
16.0	22.8	44.8	-2.6	.5	.0247	.463	.495	.474	.514	.459	.490	.505	.444	.444	.423	.423	.444	.455	.455
17.0	22.5	44.2	-2.5	.9	.0501	.463	.492	.468	.509	.462	.498	.511	.440	.440	.419	.419	.440	.462	.462
18.0	22.4	43.9	-2.5	.5	.0254	.463	.499	.465	.506	.461	.493	.506	.439	.461	.417	.417	.439	.461	.461
19.0	22.2	43.6	-2.5	.5	.0257	.463	.501	.468	.505	.459	.488	.501	.451	.451	.429	.429	.451	.451	.440
20.0	22.1	43.2	-2.4	.5	.0260	.463	.511	.469	.504	.460	.491	.500	.447	.447	.425	.425	.447	.447	.447
21.0	21.9	42.9	-2.4	.5	.0262	.463	.505	.470	.499	.457	485	.499	.446	.446	.424	.424	.446	.479	.446
22.0	21.8	42.6	-2.4	.5	.0265	.463	.496	.461	.496	.454	483	.494	.461	.461	.439	.439	.439	.461	.439
23.0	21.6	42.3	-2.3	.5	.0268	.463	.492	.459	.497	.459	.483	.497	.454	.454	.432	.432	.454	.466	.443
24.0	21.5	42.0	-2.3	.5	.0271	.463	.493	.464	.504	.464	.491	.493	.448	.448	.425	.425	.448	.471	.448
25.0	21.3	41.7	-2.3	.5	.0274	.463	.492	.461	.513	.470	488	.495	.447	.447	.424	424	.447	.470	.447
26.0	21.2	41.4	-2.2	.5	.0277	.463	.495	.462	.504	.462	485	.497	.449	.449	.426	426	.449	.472	.449
27.0	21.2	41.4	-2.7	0.0	0.0000	.463	.490	.460	.501	460	488	.499	.446	.446	446	.423	446	.469	.446
28.0	21.0	41.0	-2.2	.5	.0280	.463	.496	.461	.505	.463	491	.502	.447	.447	.424	.424	.447	.470	.447
29.0	20.9	40.7	-2.2	.5	.0283	.463	.496	.471	.505	.471	489	.501	.445	.445	.422	422	.445	.468	.445
30.0	20.7	40.4	-2.1	.5	.0287	.463	.496	.467	.519	.479	.496	.498	.442	.442	.418	.416	.442	.465	.442
31.0	20.7	40.4	-2.1	0.0	0.0000	.463	.492	.463	.513	.473	.499	.499	.437	.437	.437	.437	.437	.461	.437
32.0	20.5	40.1	-2.1	.5	.0290	.463	.490	.462	.509	.467	.495	.502	.436	.436	.436	.436	.448	.459	.448
33.0	20.4	39.8	-2.0	.5	.0293	.463	.492	.457	.502	.461	.492	.502	.435	.435	.435	.435	.459	.459	.459
34.0	20.4	39.8	-2.0	0.0	0.0000	.463	.498	.462	.505	.465	.489	.498	.434	.434	.434	.434	.457	.457	.457

Table 11B — Inferred Pressurant Distribution, Scaling Run 239; Three 3.279-cm Nozzles

t (s)	T (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	2.1	2.1	37.2	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	4.5	5.2	-9.3	70.0	4.0103	.050	-.284	-.077	.500	-.064	-.139	-.119	.005	-.098	-.064	.005	.005	.865	.108
VALVE FULLY OPEN																			
2.0	9.1	12.5	-12.1	9.9	.9380	.136	-.064	.054	.425	.066	.017	.034	.095	.034	.034	.054	.095	.747	.176
3.0	11.8	17.4	-9.8	8.8	.7330	.205	.003	.073	.493	.176	.114	.165	.121	.103	.084	.121	.158	.839	.213
4.0	13.7	21.3	-8.1	7.2	.4989	.258	.091	.247	.567	.217	.183	.224	.142	.142	.125	.142	.159	.891	.227
5.0	14.7	24.2	-7.3	6.9	.4208	.302	.156	.267	.657	.251	.242	.277	.194	.210	.163	.163	.194	.940	.210
6.0	15.4	26.9	-7.1	5.9	.3134	.338	.199	.278	.694	.258	.275	.311	.228	.228	.199	.228	.258	.920	.317
7.0	15.6	28.8	-7.0	6.2	.2899	.368	.235	.280	.704	.291	.263	.294	.299	.313	.271	.243	.355	.927	.313
8.0	16.0	31.0	-7.1	4.6	.1897	.394	.281	.325	.734	.286	.310	.383	.312	.299	.286	.273	.325	.955	.351
9.0	16.1	32.7	-7.3	5.0	.1874	.416	.325	.357	.747	.352	.365	.397	.340	.327	.315	.315	.340	.927	.302
10.0	16.0	33.7	-7.5	4.9	.1152	.429	.335	.367	.748	.364	.359	.384	.354	.342	.330	.330	.379	.950	.347
COMMENCE VALVE CLOSURE																			
11.0	15.9	34.9	-7.7	5.3	.1654	.447	.349	.380	.744	.375	.408	.436	.347	.358	.347	.347	.394	.946	.382
12.0	15.4	36.4	-9.2	1.3	.0696	.461	.396	.455	.723	.390	.425	.464	.357	.368	.357	.357	.401	.916	.390
VALVE FULLY CLOSED																			
13.0	15.2	36.9	-9.9	-.3	-.0165	.464	.461	.474	.542	.408	.442	.459	.380	.402	.391	.391	.423	.775	.487
14.0	15.2	36.9	-9.9	0.0	0.0000	.464	.470	.459	.457	.433	.472	.495	.423	.433	.423	.423	.444	.647	.455
15.0	15.0	36.6	-9.9	.5	.0285	.464	.480	.450	.422	.437	.480	.497	.441	.452	.441	.441	.430	.635	.430
16.0	14.7	36.0	-9.8	1.1	.0580	.464	.487	.457	.420	.441	.476	.498	.420	.452	.441	.441	.441	.627	.431
17.0	14.6	35.6	-9.7	.6	.0295	.464	.491	.460	.416	.445	.485	.505	.421	.454	.443	.443	.443	.608	.421
18.0	14.3	35.0	-9.6	1.2	.0601	.464	.500	.464	.408	.444	.484	.505	.437	.448	.437	.437	.437	.628	.404
19.0	14.1	34.6	-9.5	.6	.0306	.464	.507	.471	.412	.455	.498	.514	.430	.441	.430	.430	.430	.622	.396
20.0	14.0	34.3	-9.4	.6	.0310	.464	.505	.480	.418	.459	.505	.528	.432	.443	.432	.421	.409	.603	.398
21.0	13.9	34.0	-9.4	.6	.0314	.464	.493	.467	.412	.463	.509	.527	.430	.442	.430	.430	.430	.603	.396
22.0	13.7	33.6	-9.3	.6	.0318	.464	.492	.464	.401	.453	.497	.518	.450	.450	.439	.439	.439	.578	.415
23.0	13.6	33.3	-9.3	.6	.0322	.464	.494	.458	.400	.451	.494	.512	.449	.461	.426	.449	.449	.578	.414
24.0	13.4	33.0	-9.2	.6	.0326	.464	.500	.455	.393	.446	.488	.507	.443	.455	.443	.443	.443	.597	.419
25.0	13.4	33.0	-9.2	0.0	0.0000	.464	.496	.460	.394	.443	.488	.512	.441	.453	.441	.441	.441	.595	.429
26.0	13.3	32.6	-9.1	.6	.0330	.464	.499	.461	.398	.446	.489	.511	.439	.451	.439	.439	.439	.595	.427
27.0	13.1	32.3	-9.0	.6	.0335	.464	.497	.461	.396	.452	.495	.517	.437	.449	.437	.437	.437	.594	.425
28.0	13.0	32.0	-9.0	.6	.0339	.464	.504	.465	.397	.450	.497	.514	.436	.448	.436	.436	.436	.594	.423
29.0	12.8	31.6	-8.9	.7	.0344	.464	.506	.469	.395	.452	.496	.514	.435	.447	.435	.435	.435	.595	.422
30.0	12.8	31.6	-8.9	0.0	0.0000	.464	.506	.469	.397	.449	.496	.516	.434	.447	.434	.434	.434	.595	.422
31.0	12.7	31.3	-8.8	.7	.0349	.464	.509	.469	.409	.457	.494	.514	.432	.444	.432	.432	.432	.594	.419
32.0	12.7	31.3	-8.8	0.0	0.0000	.464	.505	.468	.416	.458	.490	.513	.428	.466	.428	.428	.428	.590	.416
33.0	12.5	31.0	-8.8	.7	.0354	.464	.501	.471	.418	.460	.493	.513	.438	.463	.425	.425	.425	.589	.413
34.0	12.4	30.6	-8.7	.7	.0359	.464	.498	.465	.421	.462	.503	.513	.444	.457	.419	.419	.419	.610	.406

Table 12B — Inferred Pressurant Distribution, Scaling Run 240; Three 3.279-cm Nozzles

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	2.6	2.6	43.4	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	5.0	5.4	-4.7	75.6	3.2002	.041	-.436	-.077	.829	-.008	-.336	-.356	-.018	-.167	-.167	-.067	.032	1.127	.182
VALVE FULLY OPEN																			
2.0	9.6	12.3	-8.4	13.3	1.2869	.130	-.141	-.015	.689	.092	-.141	-.150	.034	.010	.010	.058	.058	.882	.301
3.0	12.7	17.6	-7.0	8.2	.6[illegible]	.199	-.069	.098	.668	.139	.009	.049	.082	.102	.062	.062	.102	.956	.326
4.0	14.3	21.0	-5.4	8.7	.6146	.254	-.002	.221	.735	.153	.066	.093	.131	.131	.112	.131	.206	.981	.338
5.0	15.9	24.6	-4.9	5.5	.3262	.296	.085	.218	.771	.201	.150	.167	.170	.187	.153	.187	.255	.935	.374
6.0	16.2	26.6	-4.6	7.5	.4107	.334	.124	.262	.799	.255	.185	.201	.210	.210	.210	.210	.258	.979	.434
7.0	16.5	28.6	-4.6	6.3	.2968	.364	.183	.318	.827	.261	.228	.267	.273	.228	.228	.258	.318	1.011	.333
8.0	16.9	30.6	-4.6	5.3	.2210	.390	.223	.365	.841	.303	.269	.280	.286	.286	.271	.271	.356	.980	.342
9.0	16.6	31.5	-4.7	7.5	.2882	.413	.239	.397	.847	.295	.275	.328	.303	.317	.317	.317	.372	1.007	.358
10.0	17.1	33.3	-4.8	1.4	.0297	.425	.268	.355	.833	.336	.315	.339	.334	.347	.347	.347	.373	1.004	.334
COMMENCE VALVE CLOSURE																			
11.0	16.9	34.2	-5.0	6.1	.1981	.443	.310	.379	.854	.356	.341	.338	.349	.361	.336	.336	.412	.974	.417
12.0	16.3	35.3	-6.1	3.5	.1500	.459	.331	.418	.820	.346	.336	.370	.380	.367	.367	.367	.416	.972	.476
VALVE FULLY CLOSED																			
13.0	17.1	38.3	-7.4	-4.8	-.2083	.464	.389	.434	.690	.393	.393	.399	.389	.410	.410	.410	.443	.793	.476
14.0	17.4	39.0	-7.5	-1.2	-.0506	.464	.416	.440	.513	.412	.427	.453	.446	.457	.435	.457	.457	.651	.468
15.0	17.3	38.7	-7.4	.6	.0252	.464	.434	.443	.491	.426	.441	.454	.434	.456	.456	.456	.456	.629	.456
16.0	17.0	38.0	-7.4	1.2	.0512	.464	.443	.449	.489	.438	.443	.458	.443	.454	.454	.454	.432	.630	.443
17.0	16.7	37.4	-7.3	1.2	.0522	.464	.440	.453	.491	.444	.451	.462	.438	.449	.449	.449	.449	.617	.438
18.0	16.5	37.1	-7.3	.6	.0265	.464	.446	.457	.484	.452	.452	.461	.434	.446	.446	.446	.446	.626	.434
19.0	16.4	36.8	-7.2	.6	.0268	.464	.445	.457	.482	.454	.464	.461	.429	.441	.441	.441	.441	.645	.429
20.0	16.2	36.5	-7.2	.6	.0271	.464	.452	.459	.482	.464	.466	.464	.429	.441	.441	.441	.441	.624	.429
21.0	16.1	36.2	-7.2	.6	.0274	.464	.452	.459	.479	.459	.461	.465	.447	.459	.435	.435	.435	.620	.424
22.0	15.9	35.9	-7.1	.6	.0277	.464	.452	.457	.482	.464	.461	.471	.440	.452	.452	.440	.429	.615	.417
23.0	15.8	35.6	-7.1	.6	.0280	.464	.454	.461	.485	.464	.461	.473	.440	.452	.452	.428	.428	.616	.417
24.0	15.6	35.3	-7.0	.7	.0283	.464	.455	.459	.485	.459	.462	.474	.440	.452	.452	.429	.429	.618	.417
25.0	15.5	34.9	-7.0	.7	.0287	.464	.457	.464	.483	.457	.459	.471	.437	.449	.449	.426	.426	.616	.437
26.0	15.3	34.6	-7.0	.7	.0290	.464	.462	.467	.488	.455	.457	.469	.431	.443	.443	.443	.431	.611	.431
27.0	15.3	34.6	-7.0	0.0	0.0000	.464	.470	.473	.494	.453	.465	.475	.424	.437	.437	.437	.437	.605	.424
28.0	15.2	34.3	-6.9	.7	.0293	.464	.465	.479	.499	.453	.455	.472	.424	.436	.436	.436	.436	.618	.424
29.0	15.0	34.0	-6.9	.7	.0297	.464	.462	.467	.486	.452	.454	.469	.447	.435	.435	.435	.435	.631	.423
30.0	15.0	34.0	-6.9	0.0	0.0000	.464	.460	.463	.485	.455	.455	.467	.448	.436	.436	.436	.436	.631	.423
31.0	14.9	33.7	-6.8	.7	.0300	.464	.465	.463	.483	.458	.456	.470	.423	.436	.436	.436	.436	.633	.436
32.0	14.7	33.4	-6.8	.7	.0304	.464	.468	.460	.485	.463	.455	.470	.420	.433	.433	.433	.433	.632	.445
33.0	14.7	33.4	-6.8	0.0	0.0000	.464	.463	.458	.481	.458	.458	.466	.428	.453	.428	.428	.428	.640	.441
34.0	14.6	33.1	-6.8	.7	.0308	.464	.458	.461	.479	.453	.453	.461	.436	.448	.423	.423	.423	.674	.436
XXX																			

Table 13B — Inferred Pressurant Distribution, Scaling Run 241; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	16.7	16.7	22.4	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	18.4	18.3	23.1	97.3	1.8892	.019	.472	.325	.073	.178	.283	.514	-.348	-.138	-.138	-.138	-.138	-.348	-.348
VALVE FULLY OPEN																			
2.0	22.2	22.3	20.5	9.1	.3523	.057	-1.380	-1.156	-.989	-.933	-1.260	-1.604	1.472	1.472	.633	.913	.633	1.472	1.472
3.0	25.0	26.0	14.9	2.6	.0957	.091	-.136	-.100	-.082	-.082	-.127	-.145	.392	.303	.124	.213	.213	.303	.303
4.0	27.5	29.6	12.2	.6	.0212	.121	.002	.019	.019	.013	.007	-.004	.225	.254	.197	.197	.168	.254	.225
5.0	29.3	32.5	10.6	2.2	.0692	.148	.135	.117	.085	.076	.094	.090	.176	.176	.222	.176	.176	.222	.176
6.0	31.2	35.6	9.7	-.4	-.0113	.172	.196	.173	.150	.154	.123	.111	.212	.193	.212	.173	.135	.212	.193
7.0	32.4	38.0	9.4	3.1	.0883	.195	.215	.194	.194	.176	.169	.176	.222	.187	.187	.187	.187	.222	.222
8.0	33.3	39.9	9.3	4.4	.1196	.217	.233	.237	.256	.210	.214	.220	.204	.220	.188	.188	.188	.220	.237
9.0	34.4	42.1	9.3	2.0	.0482	.236	.236	.242	.230	.236	.236	.233	.196	.227	.227	.227	.227	.257	.288
10.0	34.4	42.7	9.4	7.4	.1289	.249	.266	.269	.230	.260	.272	.272	.182	.212	.242	.242	.242	.272	.272
11.0	35.0	44.2	9.5	4.2	.0966	.266	.287	.273	.270	.261	.267	.270	.204	.218	.261	.261	.276	.304	.304
12.0	35.7	46.0	9.6	2.4	.0518	.281	.284	.281	.262	.270	.284	.294	.229	.229	.284	.284	.284	.338	.338
13.0	35.2	46.0	9.7	10.0	.2359	.298	.332	.318	.293	.315	.340	.354	.202	.230	.285	.285	.285	.312	.326
14.0	35.7	47.3	9.9	3.3	.0639	.311	.333	.349	.365	.344	.333	.330	.258	.232	.312	.285	.285	.312	.312
15.0	36.6	49.2	10.0	-.2	-.0029	.323	.400	.354	.349	.341	.318	.300	.282	.321	.308	.308	.282	.333	.308
16.0	36.7	50.0	10.1	5.2	.0947	.336	.396	.396	.393	.373	.340	.318	.285	.285	.310	.310	.285	.335	.335
17.0	36.8	50.9	10.2	4.8	.0859	.347	.375	.372	.370	.365	.360	.358	.276	.289	.326	.350	.326	.363	.387
18.0	36.8	51.6	10.3	5.5	.0948	.359	.400	.393	.366	.381	.383	.376	.265	.289	.337	.313	.337	.410	.410
19.0	36.3	51.3	10.4	10.6	.1296	.366	.411	.404	.418	.413	.401	.387	.259	.259	.357	.333	.333	.382	.406
20.0	36.6	52.3	10.4	2.8	.0420	.376	.438	.426	.426	.424	.417	.434	.278	.290	.350	.314	.326	.374	.386
21.0	36.3	52.4	10.5	7.9	.1315	.386	.426	.438	.436	.448	.443	.407	.281	.328	.328	.328	.352	.400	.400
22.0	35.8	52.2	10.6	9.5	.1488	.396	.420	.420	.432	.441	.446	.437	.302	.302	.374	.374	.374	.422	.398
23.0	36.5	53.9	10.7	-3.2	-.0364	.402	.427	.429	.436	.427	.422	.411	.307	.376	.399	.376	.376	.422	.422
24.0	36.4	54.3	10.8	6.0	.0812	.410	.435	.432	.430	.416	.423	.412	.313	.347	.405	.416	.428	.439	.439
25.0	36.5	55.0	10.8	3.5	.0445	.418	.411	.411	.422	.402	.406	.406	.325	.347	.438	.438	.461	.483	.483
26.0	36.2	54.8	10.8	9.8	.0909	.423	.428	.430	.428	.428	.428	.451	.321	.344	.412	.435	.435	.481	.481
27.0	35.5	54.2	10.9	10.9	.1570	.431	.444	.456	.456	.451	.460	.463	.313	.347	.428	.428	.428	.474	.463
COMMENCE VALVE CLOSURE																			
28.0	35.1	54.0	10.9	9.3	.1152	.438	.460	.463	.467	.463	.467	.472	.356	.356	.425	.425	.425	.449	.472
29.0	35.0	54.3	10.9	3.4	.0664	.445	.496	.471	.494	.464	.473	.467	.361	.361	.441	.441	.430	.441	.441
VALVE FULLY CLOSED																			
30.0	34.8	54.5	10.8	3.5	.0690	.451	.512	.503	.487	.494	.505	.519	.386	.386	.409	.409	.409	.432	.409
31.0	36.9	58.2	10.9	-13.6	-.2668	.451	.504	.494	.483	.479	.473	.490	.382	.382	.413	.424	.424	.456	.456
32.0	38.0	60.1	11.0	-6.8	-.1328	.451	.489	.493	.499	.477	.467	.450	.391	.391	.432	.432	.432	.452	.452
33.0	38.5	61.0	11.0	-2.8	-.0548	.451	.489	.489	.481	.465	.461	.455	.391	.391	.431	.431	.451	.451	.471
34.0	38.8	61.5	11.1	-1.8	-.0359	.451	.490	.494	.480	.470	.460	.452	.381	.401	.430	.440	.440	.460	.460
35.0	38.9	61.8	11.1	-.9	-.0177	.451	.491	.483	.481	.457	.457	.463	.390	.390	.430	.430	.449	.469	.469
36.0	39.1	62.1	11.1	-.9	-.0176	.451	.481	.478	.468	.462	.464	.466	.385	.385	.434	.444	.444	.483	.464
37.0	39.1	62.1	11.1	0.0	0.0000	.451	.480	.480	.466	.464	.458	.456	.403	.403	.442	.442	.423	.481	.462
38.0	38.9	61.8	11.1	.9	.0176	.451	.471	.471	.465	.461	.463	.467	.400	.419	.459	.439	.429	.459	.459
39.0	38.9	61.8	11.1	0.0	0.0000	.451	.458	.460	.470	.472	.476	.468	.386	.425	.445	.425	.445	.464	.464
40.0	38.9	61.8	11.1	0.0	0.0000	.451	.456	.462	.471	.469	.481	.479	.381	.420	.440	.440	.440	.460	.460
41.0	38.8	61.5	11.1	.9	.0177	.451	.460	.464	.472	.474	.478	.476	.395	.425	.435	.435	.435	.455	.455
42.0	38.6	61.2	11.0	.9	.0179	.451	.457	.464	.476	.468	.470	.470	.405	.425	.445	.425	.445	.464	.445
43.0	38.5	61.0	11.0	.9	.0180	.451	.459	.463	.471	.467	.463	.473	.403	.433	.443	.433	.443	.463	.443
44.0	38.3	60.7	11.0	.9	.0181	.451	.463	.463	.469	.467	.463	.475	.403	.423	.443	.443	.443	.463	.443
45.0	38.3	60.7	11.0	0.0	0.0000	.451	.465	.461	.465	.465	.461	.469	.400	.441	.441	.451	.441	.461	.441
46.0	38.1	60.4	11.0	.9	.0183	.451	.464	.460	.462	.458	.460	.466	.418	.438	.438	.456	.438	.456	.438
47.0	38.1	60.4	11.0	0.0	0.0000	.451	.466	.466	.458	.456	.456	.472	.425	.435	.445	.456	.435	.456	.435
48.0	38.0	60.1	11.0	.9	.0184	.451	.465	.467	.457	.451	.455	.472	.433	.433	.453	.453	.433	.453	.433
49.0	38.0	60.1	11.0	0.0	0.0000	.451	.473	.465	.463	.449	.459	.467	.430	.430	.451	.451	.430	.461	.430
50.0	37.8	59.9	11.0	.9	.0185	.451	.472	.464	.460	.452	.452	.466	.448	.427	.448	.446	.427	.468	.427

Table 14B — Inferred Pressurant Distribution, Scaling Run 242; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	T_p (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	19.7	19.7	65.1	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	22.3	21.9	35.8	92.5	2.6876	.029	.201	.165	.020	.049	.143	.230	-.052	-.052	-.088	-.088	-.016	-.088	-.057
VALVE FULLY OPEN																			
2.0	25.9	25.5	31.2	2.2	.0843	.065	.418	.418	.418	.401	.472	.490	-.329	-.240	-.151	-.329	-.151	-.329	-.240
3.0	28.8	28.9	28.0	1.1	.0379	.058	-2.431	-2.201	-2.087	-2.087	-2.316	-2.316	3.087	1.937	1.363	2.512	1.363	2.512	1.937
4.0	30.9	31.6	25.8	2.9	.0965	.127	-.140	-.105	-.122	-.122	-.122	-.227	.593	.331	.157	.244	.244	.593	.331
5.0	32.9	34.2	25.9	.6	.0195	.154	.035	-.014	-.026	.011	-.026	-.026	.240	.240	.301	.301	.301	.422	.240
6.0	34.1	36.0	25.2	.2	.0032	.170	.129	.083	.129	.110	.101	.027	.166	.166	.213	.213	.213	.398	.259
7.0	35.4	37.8	25.2	3.4	.0945	.192	.230	.222	.175	.230	.238	.238	.127	.127	.127	.206	.127	.246	.206
8.0	36.8	40.0	24.8	1.1	.0278	.213	.311	.251	.251	.205	.172	.146	.185	.185	.218	.218	.152	.284	.185
9.0	37.5	41.6	23.9	4.6	.1173	.232	.277	.232	.186	.158	.181	.249	.192	.192	.277	.249	.249	.333	.249
10.0	37.5	42.3	23.5	7.7	.2013	.252	.249	.239	.249	.239	.265	.249	.217	.217	.244	.244	.244	.351	.271
11.0	38.3	43.9	23.0	2.8	.0636	.269	.270	.280	.261	.275	.280	.275	.179	.251	.299	.251	.251	.347	.275
12.0	38.4	44.6	22.8	7.0	.1589	.285	.317	.298	.294	.335	.349	.335	.110	.248	.271	.271	.225	.362	.294
13.0	38.9	45.9	22.3	3.8	.0760	.299	.358	.350	.358	.337	.337	.341	.158	.201	.286	.265	.265	.350	.286
14.0	39.3	47.2	21.9	3.9	.0721	.312	.356	.375	.344	.371	.375	.304	.158	.197	.296	.296	.296	.375	.316
15.0	39.1	47.4	21.8	7.9	.1093	.322	.351	.362	.339	.347	.355	.390	.202	.241	.300	.300	.300	.378	.319
16.0	39.3	48.3	21.4	4.9	.0887	.334	.351	.343	.328	.343	.343	.351	.228	.247	.339	.358	.339	.432	.339
17.0	39.8	49.8	20.8	2.8	.0432	.345	.378	.365	.354	.354	.361	.392	.261	.296	.347	.347	.279	.416	.330
18.0	39.8	50.4	20.6	5.4	.0939	.356	.371	.364	.371	.360	.381	.377	.277	.310	.360	.360	.327	.427	.344
19.0	39.9	51.2	20.2	5.4	.0891	.367	.398	.382	.366	.388	.401	.404	.291	.291	.372	.372	.340	.404	.356
20.0	39.4	51.2	20.0	9.1	.1523	.377	.409	.393	.397	.416	.429	.429	.272	.288	.368	.384	.336	.400	.384
21.0	39.2	51.7	19.5	6.9	.1059	.387	.438	.429	.410	.432	.447	.460	.265	.296	.373	.373	.342	.404	.358
22.0	39.6	52.5	19.4	.7	.0058	.392	.472	.454	.427	.424	.409	.388	.312	.312	.357	.388	.357	.388	.403
23.0	38.9	52.2	19.0	10.7	.1727	.401	.480	.453	.429	.405	.372	.360	.302	.333	.393	.408	.408	.453	.423
24.0	38.8	52.7	18.7	6.5	.0886	.409	.469	.425	.419	.401	.398	.395	.310	.339	.413	.413	.413	.501	.427
25.0	39.3	54.2	18.5	-.6	-.0068	.416	.439	.425	.419	.419	.419	.419	.321	.377	.419	.405	.419	.489	.433
26.0	39.2	54.7	18.1	6.2	.0787	.423	.451	.440	.427	.440	.418	.413	.315	.342	.437	.410	.410	.519	.478
27.0	39.6	56.1	17.5	.8	.0089	.429	.439	.421	.410	.431	.428	.444	.335	.348	.465	.439	.426	.517	.478
COMMENCE VALVE CLOSURE																			
28.0	38.8	55.4	17.4	12.0	.1620	.437	.474	.445	.430	.459	.474	.487	.322	.322	.440	.440	.414	.493	.480
29.0	37.9	54.6	17.0	5.7	.1682	.443	.487	.479	.476	.476	.484	.487	.330	.303	.423	.423	.423	.503	.463
VALVE FULLY CLOSED																			
30.0	38.1	57.2	14.6	.6	.0183	.448	.495	.481	.465	.479	.481	.484	.352	.340	.434	.434	.434	.481	.458
31.0	40.4	61.1	14.8	-9.7	-.2072	.448	.488	.484	.475	.468	.466	.473	.350	.371	.447	.447	.447	.468	.436
32.0	41.5	63.0	14.9	-4.5	-.1322	.448	.486	.465	.444	.454	.469	.484	.384	.373	.457	.446	.446	.477	.436
33.0	42.1	64.1	15.0	-2.5	-.0725	.448	.502	.471	.449	.457	.467	.469	.371	.392	.463	.443	.443	.463	.437
34.0	42.4	64.7	15.0	-1.2	-.0355	.448	.498	.482	.460	.458	.464	.478	.365	.385	.456	.436	.426	.476	.436
35.0	42.6	65.0	15.0	-.6	-.0176	.448	.483	.475	.465	.463	.473	.481	.375	.375	.465	.445	.425	.465	.435
36.0	42.6	65.0	15.0	0.0	0.0000	.448	.479	.473	.467	.471	.473	.473	.367	.367	.457	.437	.437	.477	.447
37.0	42.6	65.0	15.0	0.0	0.0000	.448	.469	.463	.459	.459	.461	.465	.375	.385	.445	.445	.445	.495	.455
38.0	42.6	65.0	15.0	0.0	0.0000	.448	.465	.459	.453	.455	.463	.465	.371	.391	.461	.441	.441	.481	.471
39.0	42.4	64.7	15.0	.6	.0176	.448	.453	.451	.457	.455	.465	.475	.393	.393	.453	.453	.433	.483	.453
40.0	42.3	64.4	15.0	.6	.0177	.448	.457	.453	.457	.461	.477	.485	.398	.398	.449	.449	.429	.469	.439
41.0	42.1	64.1	15.0	.6	.0178	.448	.456	.454	.456	.462	.476	.478	.401	.391	.462	.452	.441	.462	.431
42.0	42.1	64.1	15.0	0.0	0.0000	.448	.453	.451	.451	.461	.469	.473	.406	.385	.457	.457	.436	.477	.446
43.0	42.0	63.1	15.9	.6	.0179	.448	.462	.457	.451	.464	.474	.477	.379	.379	.453	.453	.453	.474	.443
44.0	42.0	62.6	16.5	0.0	0.0000	.448	.456	.449	.447	.462	.469	.473	.388	.388	.443	.453	.453	.486	.453
45.0	41.8	61.6	17.3	.6	.0181	.448	.466	.448	.443	.461	.466	.475	.382	.382	.439	.461	.439	.507	.450
46.0	41.6	60.7	18.2	.6	.0182	.448	.474	.446	.453	.462	.471	.479	.398	.398	.434	.434	.434	.493	.446
47.0	41.6	60.0	19.0	0.0	0.0000	.448	.476	.447	.449	.471	.474	.483	.393	.393	.430	.430	.430	.503	.447
48.0	41.5	59.1	19.7	.6	.0183	.448	.475	.457	.449	.472	.480	.493	.399	.386	.424	.424	.424	.500	.437
49.0	41.5	58.7	20.3	0.0	0.0000	.448	.470	.454	.451	.464	.477	.490	.430	.378	.417	.417	.417	.496	.457
50.0	41.5	58.2	20.9	0.0	0.0000	.448	.477	.464	.466	.469	.472	.498	.402	.375	.415	.415	.415	.496	.456

Table 15B — Inferred Pressurant Distribution, Scaling Run 243; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	16.7	16.7	16.6	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	18.5	18.4	21.2	95.5	2.0351	.021	.771	.518	.046	.336	.626	.844	-.280	-.280	-.643	-.643	-.280	-.461	-.280
VALVE FULLY OPEN																			
2.0	22.5	22.7	19.4	1.7	.0631	.057	-.654	-.592	-.529	-.529	-.747	-.716	.622	.622	.778	.778	.467	.778	.467
3.0	25.5	26.7	14.1	-.1	-.0043	.091	-.079	-.055	-.024	-.055	-.103	-.127	.238	.238	.238	.238	.159	.276	.238
4.0	27.7	30.0	10.8	1.6	.0551	.122	.005	.046	.051	.020	.005	.015	.254	.202	.228	.176	.176	.228	.176
5.0	29.4	33.0	9.0	2.8	.0896	.150	.089	.097	.135	.110	.085	.064	.181	.181	.181	.222	.181	.243	.181
6.0	31.1	35.9	8.1	.5	.0143	.174	.136	.136	.143	.133	.115	.107	.226	.172	.226	.206	.190	.262	.208
7.0	32.9	39.0	7.6	-1.2	-.0311	.196	.155	.171	.164	.177	.171	.148	.202	.202	.234	.234	.202	.250	.234
8.0	33.4	40.6	7.5	5.6	.1584	.218	.235	.211	.193	.202	.205	.208	.196	.226	.226	.226	.211	.271	.226
9.0	34.1	42.4	7.6	4.0	.1082	.238	.240	.252	.249	.243	.249	.223	.223	.252	.223	.223	.223	.266	.223
10.0	34.3	43.2	7.7	6.3	.1078	.251	.272	.278	.286	.272	.272	.258	.213	.213	.241	.241	.213	.255	.241
11.0	35.2	45.2	7.8	1.6	.0359	.267	.282	.293	.306	.301	.280	.274	.242	.229	.242	.242	.242	.282	.256
12.0	36.3	47.5	7.9	-.7	-.0137	.282	.284	.279	.289	.279	.277	.274	.249	.274	.274	.274	.274	.337	.299
13.0	35.8	47.6	8.2	9.3	.2273	.299	.285	.302	.300	.300	.315	.333	.239	.290	.302	.302	.290	.328	.302
14.0	36.1	48.8	8.3	4.0	.0796	.313	.324	.324	.324	.339	.344	.327	.250	.275	.300	.324	.300	.312	.324
15.0	35.9	49.3	8.5	7.1	.1443	.327	.346	.346	.368	.334	.316	.324	.248	.272	.309	.334	.334	.370	.346
16.0	36.9	51.2	8.6	-1.7	-.0261	.337	.408	.356	.354	.314	.323	.316	.248	.272	.342	.366	.342	.377	.366
17.0	36.5	51.2	8.7	9.1	.1230	.346	.396	.375	.361	.337	.335	.337	.248	.271	.366	.366	.366	.377	.366
18.0	36.2	51.5	8.9	7.3	.1302	.358	.390	.397	.380	.324	.362	.343	.254	.289	.371	.371	.371	.418	.383
19.0	36.0	51.9	9.0	6.6	.1141	.369	.383	.383	.383	.364	.385	.403	.285	.285	.378	.378	.378	.413	.378
20.0	35.9	52.3	9.1	6.3	.1021	.379	.387	.392	.390	.390	.411	.411	.269	.316	.385	.374	.362	.443	.397
21.0	36.1	53.2	9.2	3.3	.0471	.388	.394	.403	.417	.399	.392	.394	.285	.330	.399	.399	.399	.433	.399
22.0	37.0	55.1	9.2	-3.6	-.0433	.395	.406	.402	.397	.404	.406	.408	.293	.347	.402	.413	.413	.434	.413
23.0	36.4	54.8	9.3	9.0	.1412	.405	.435	.435	.406	.417	.419	.426	.290	.356	.400	.400	.422	.433	.422
24.0	36.0	54.6	9.4	10.0	.1021	.411	.438	.439	.430	.414	.412	.421	.308	.330	.419	.419	.419	.452	.419
25.0	35.9	54.9	9.5	5.7	.0736	.418	.470	.459	.435	.411	.415	.420	.325	.347	.424	.424	.424	.446	.435
26.0	35.9	55.4	9.5	5.3	.0676	.426	.467	.454	.441	.426	.417	.415	.343	.365	.430	.430	.430	.463	.452
27.0	35.8	55.8	9.6	5.0	.0624	.433	.458	.443	.425	.436	.434	.428	.361	.350	.447	.436	.447	.501	.456
COMMENCE VALVE CLOSURE																			
28.0	35.5	55.8	9.6	7.7	.0975	.440	.454	.452	.458	.448	.465	.458	.350	.328	.458	.437	.437	.513	.458
29.0	35.6	56.5	9.6	1.7	.0357	.446	.464	.457	.449	.451	.451	.444	.380	.370	.455	.444	.444	.506	.476
VALVE FULLY CLOSED																			
30.0	35.2	56.3	9.5	4.1	.0874	.451	.493	.486	.478	.476	.476	.465	.356	.356	.463	.441	.441	.473	.463
31.0	36.3	58.3	9.5	-6.8	-.1458	.451	.491	.485	.467	.473	.479	.477	.362	.342	.465	.444	.465	.475	.444
32.0	37.3	60.1	9.5	-5.5	-.1185	.451	.476	.470	.478	.472	.474	.478	.361	.361	.460	.460	.460	.470	.450
33.0	37.7	60.9	9.5	-2.7	-.0572	.451	.468	.468	.468	.466	.470	.478	.365	.384	.462	.462	.462	.472	.443
34.0	38.1	61.5	9.5	-1.7	-.0374	.451	.470	.470	.468	.464	.468	.470	.376	.395	.463	.453	.453	.482	.434
35.0	38.1	61.5	9.5	0.0	0.0000	.451	.474	.468	.468	.462	.466	.466	.370	.389	.466	.447	.447	.495	.447
36.0	38.1	61.5	9.5	0.0	0.0000	.451	.464	.460	.460	.458	.462	.462	.371	.381	.468	.458	.458	.497	.468
37.0	38.1	61.5	9.5	0.0	0.0000	.451	.459	.461	.455	.459	.461	.461	.374	.374	.471	.471	.471	.480	.471
38.0	37.9	61.2	9.5	.9	.0186	.451	.454	.460	.460	.460	.460	.462	.392	.373	.469	.469	.469	.479	.460
39.0	37.9	61.2	9.5	0.0	0.0000	.451	.454	.458	.460	.456	.458	.462	.389	.369	.466	.466	.466	.495	.466
40.0	37.7	60.9	9.5	.9	.0188	.451	.456	.456	.456	.458	.462	.468	.384	.384	.462	.462	.462	.491	.462
41.0	37.6	60.6	9.5	.9	.0189	.451	.465	.459	.453	.457	.461	.469	.389	.389	.457	.457	.467	.487	.457
42.0	37.6	60.6	9.5	0.0	0.0000	.451	.464	.460	.456	.464	.458	.474	.395	.395	.454	.454	.454	.483	.454
43.0	37.4	60.4	9.5	.9	.0191	.451	.470	.466	.460	.462	.460	.472	.393	.393	.452	.452	.452	.482	.452
44.0	37.4	60.4	9.5	0.0	0.0000	.451	.472	.465	.459	.457	.457	.465	.390	.390	.469	.449	.469	.478	.449
45.0	37.3	60.1	9.5	.9	.0192	.451	.469	.469	.456	.454	.454	.465	.406	.398	.465	.446	.465	.475	.446
46.0	37.1	59.8	9.5	.9	.0194	.451	.463	.461	.451	.453	.457	.463	.401	.401	.461	.461	.461	.471	.461
47.0	37.1	59.8	9.5	0.0	0.0000	.451	.464	.462	.454	.458	.458	.460	.400	.400	.460	.460	.460	.470	.460
48.0	36.9	59.5	9.5	.9	.0195	.451	.465	.469	.455	.455	.453	.461	.397	.407	.457	.457	.457	.477	.457
49.0	36.9	59.5	9.5	0.0	0.0000	.451	.460	.466	.452	.460	.452	.458	.412	.412	.452	.452	.452	.482	.452
50.0	36.8	59.2	9.5	.9	.0197	.451	.462	.466	.458	.460	.452	.456	.407	.407	.458	.448	.458	.486	.448

Table 16B — Inferred Pressurant Distribution, Scaling Run 244; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	17.6	17.6	18.9	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	19.6	19.5	24.6	92.0	2.0273	.022	.378	.262	.029	.126	.281	.358	-.164	-.164	-.164	-.164	-.164	-.164	-.164
VALVE FULLY OPEN																			
2.0	23.5	23.5	23.0	6.9	.2637	.059	-4.174	-3.985	-3.417	-3.039	-4.363	-5.308	3.578	3.578	3.578	3.578	2.633	4.523	3.578
3.0	26.5	27.5	17.3	.8	.0279	.093	-.093	-.093	-.093	-.084	-.143	-.162	.282	.282	.183	.282	.183	.380	.282
4.0	28.7	30.8	14.1	2.5	.0843	.123	-.008	-.002	.034	.034	.004	-.008	.251	.281	.191	.221	.161	.251	.191
5.0	30.6	33.0	12.6	2.1	.0652	.150	.093	.084	.103	.093	.084	.070	.197	.244	.197	.197	.150	.244	.197
6.0	32.0	36.3	11.8	3.6	.1067	.175	.163	.138	.138	.146	.126	.130	.171	.252	.191	.171	.191	.232	.232
7.0	33.7	39.2	11.2	-.1	-.0025	.197	.161	.161	.175	.172	.175	.143	.200	.236	.200	.200	.200	.272	.272
8.0	35.1	41.8	11.0	.7	.0172	.218	.204	.204	.204	.214	.220	.201	.201	.217	.217	.217	.217	.249	.266
9.0	35.6	43.4	10.9	5.1	.1342	.238	.244	.251	.241	.238	.235	.214	.177	.238	.208	.238	.238	.300	.269
10.0	36.2	44.7	10.9	2.3	.0357	.249	.244	.250	.247	.238	.220	.232	.208	.267	.238	.238	.238	.327	.297
11.0	36.4	45.8	10.9	6.1	.1490	.268	.285	.265	.251	.260	.280	.320	.191	.234	.263	.263	.248	.306	.306
12.0	37.2	47.5	11.0	2.3	.0495	.283	.301	.299	.307	.301	.301	.326	.217	.244	.271	.271	.244	.299	.299
13.0	37.5	48.8	11.0	4.4	.0931	.298	.319	.287	.290	.298	.301	.325	.229	.295	.282	.295	.295	.335	.322
14.0	38.1	50.2	11.2	2.7	.0518	.311	.323	.312	.310	.325	.328	.320	.271	.323	.297	.297	.297	.323	.323
15.0	37.8	50.7	11.3	7.2	.1488	.325	.349	.349	.334	.329	.331	.323	.255	.280	.318	.306	.331	.369	.356
16.0	37.5	50.8	11.4	8.4	.1681	.339	.340	.350	.350	.347	.360	.365	.259	.284	.335	.335	.335	.385	.360
17.0	37.5	51.6	11.5	5.3	.0894	.350	.378	.376	.376	.373	.388	.396	.261	.273	.323	.336	.336	.373	.361
18.0	38.0	52.9	11.6	2.0	.0323	.360	.402	.394	.397	.399	.387	.358	.249	.297	.346	.346	.346	.394	.370
19.0	38.2	53.6	11.7	2.9	.0296	.367	.426	.412	.391	.393	.376	.364	.262	.286	.357	.333	.357	.405	.405
20.0	38.1	54.0	11.8	6.1	.0996	.377	.400	.395	.412	.398	.372	.360	.270	.341	.365	.365	.377	.436	.412
21.0	37.7	54.1	11.8	8.0	.1303	.387	.39[illegible]	.404	.387	.397	.399	.397	.295	.342	.366	.390	.390	.437	.437
22.0	38.0	55.1	11.9	2.8	.0398	.396	.402	.402	.402	.411	.420	.397	.311	.358	.381	.392	.392	.450	.427
23.0	38.3	56.1	11.9	1.6	.0202	.403	.410	.412	.410	.426	.419	.414	.306	.374	.396	.396	.396	.441	.441
24.0	38.5	57.0	12.0	2.9	.0376	.411	.408	.413	.419	.433	.417	.404	.319	.386	.442	.419	.408	.442	.430
25.0	39.0	58.3	12.1	-.9	-.0103	.417	.413	.400	.415	.415	.408	.415	.339	.404	.447	.426	.426	.469	.447
26.0	38.4	57.7	12.1	11.4	.1229	.423	.436	.436	.431	.444	.453	.488	.352	.374	.418	.416	.396	.440	.418
27.0	37.7	57.2	12.1	10.3	.1435	.431	.456	.458	.458	.458	.476	.491	.356	.389	.411	.411	.411	.422	.411
28.0	36.9	56.4	12.1	11.8	.1619	.439	.469	.460	.469	.469	.478	.489	.379	.401	.424	.401	.424	.424	.424
COMMENCE VALVE CLOSURE																			
29.0	37.0	56.9	12.1	4.4	.0484	.445	.468	.466	.489	.491	.497	.486	.386	.397	.431	.406	.408	.431	.431
30.0	37.1	57.7	12.1	.9	.0192	.451	.473	.471	.469	.495	.482	.475	.396	.418	.440	.440	.418	.440	.440
VALVE FULLY CLOSED																			
31.0	37.2	58.1	12.0	.4	.0100	.454	.475	.473	.466	.479	.481	.477	.401	.423	.466	.445	.423	.445	.445
32.0	38.8	60.9	12.1	-8.8	-.1961	.454	.466	.454	.470	.472	.472	.476	.399	.440	.460	.450	.440	.450	.450
33.0	39.7	62.6	12.2	-5.0	-.1107	.454	.457	.451	.451	.461	.467	.470	.395	.455	.455	.455	.455	.474	.455
34.0	40.1	63.2	12.2	-1.6	-.0359	.454	.470	.464	.458	.458	.464	.473	.407	.446	.446	.446	.446	.466	.456
35.0	40.2	63.5	12.3	-.8	-.0177	.454	.489	.462	.450	.456	.462	.469	.391	.430	.450	.450	.450	.469	.469
36.0	40.4	63.7	12.3	-.8	-.0176	.454	.483	.456	.448	.450	.458	.462	.402	.431	.460	.460	.450	.479	.460
37.0	40.4	63.7	12.3	0.0	0.0000	.454	.477	.467	.460	.456	.464	.467	.399	.419	.458	.458	.438	.477	.458
38.0	40.4	63.7	12.3	0.0	0.0000	.454	.485	.461	.444	.448	.459	.457	.409	.428	.457	.457	.448	.487	.457
39.0	40.2	63.5	12.3	.8	.0176	.454	.473	.459	.457	.457	.457	.461	.403	.422	.461	.461	.442	.481	.461
40.0	40.1	63.2	12.2	.8	.0177	.454	.468	.460	.458	.460	.462	.466	.399	.419	.458	.458	.458	.477	.458
41.0	39.9	62.9	12.2	.8	.0179	.454	.464	.457	.455	.461	.463	.466	.415	.425	.455	.455	.455	.474	.455
42.0	39.9	62.9	12.2	0.0	0.0000	.454	.462	.454	.456	.462	.464	.470	.413	.413	.452	.472	.452	.472	.452
43.0	39.7	62.6	12.2	.8	.0180	.454	.459	.451	.455	.467	.469	.472	.407	.417	.467	.467	.457	.467	.447
44.0	39.6	62.3	12.2	.8	.0181	.454	.454	.446	.458	.464	.468	.480	.418	.418	.458	.456	.458	.458	.458
45.0	39.6	62.3	12.2	0.0	0.0000	.454	.452	.450	.458	.464	.464	.480	.414	.424	.454	.454	.454	.474	.454
46.0	39.4	62.1	12.2	.8	.0182	.454	.453	.449	.461	.465	.463	.475	.405	.425	.465	.465	.465	.465	.445
47.	39.4	62.1	12.2	0.0	0.0000	.454	.466	.458	.462	.470	.464	.472	.418	.418	.458	.458	.458	.458	.438
48.	39.3	61.8	12.2	.8	.0184	.454	.469	.463	.461	.465	.461	.463	.409	.419	.469	.449	.449	.469	.449
49.0	39.3	61.8	12.2	0.0	0.0000	.454	.473	.467	.467	.471	.459	.463	.402	.423	.463	.443	.463	.463	.443
50.0	39.1	61.5	12.2	.8	.0185	.454	.471	.471	.471	.477	.465	.467	.400	.420	[illegible]	.441	.441	.471	.441

Table 17B — Inferred Pressurant Distribution, Scaling Run 245; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	26.1	26.1	54.8	1.2	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	28.5	28.1	44.2	76.0	1.7000	.022	.178	.153	.091	.109	.153	.184	-.127	-.065	-.065	-.065	-.065	-.127	-.065
VALVE FULLY OPEN																			
2.0	32.5	32.2	38.2	.4	.0142	.060	.546	.496	.496	.546	.629	.596	-.516	-.433	- 267	-.267	-.267	-.433	-.350
3.0	35.3	35.3	35.8	5.3	.2047	.095	5.730	5.321	4.298	3.684	4.911	4.707	-6.547	-4.501	-2 455	-2.455	-2.455	-4.501	-4.501
4.0	37.8	38.4	33.5	1.7	.0590	.125	-.265	-.306	-.223	-.182	-.265	-.389	.791	.584	.273	.170	.273	.584	.584
5.0	39.6	40.7	32.9	.8	.0217	.147	-.134	-.032	-.198	-.070	-.070	-.019	.493	.429	.211	.173	.211	.493	.429
6.0	41.4	43.4	32.8	3.5	.1263	.178	.048	.048	.091	.109	.065	.074	.293	.337	.162	.162	.162	.425	.337
7.0	42.9	45.7	31.5	2.2	.0608	.201	.137	.137	.109	.137	.109	.109	.328	.328	.186	.186	.186	.328	.328
8.0	43.3	46.8	30.7	5.8	.1081	.215	.188	.175	.132	.175	.212	.237	.293	.293	.231	.169	.169	.293	.231
9.0	43.9	48.1	30.5	5.5	.1495	.236	.263	.241	.201	.212	.212	.224	.258	.258	.201	.229	.229	.286	.258
10.0	44.5	49.4	30.2	5.5	.1380	.255	.266	.261	.234	.255	.261	.266	.120	.224	224	.224	.276	.381	.328
11.0	45.6	51.4	30.8	1.1	.0237	.272	.263	.272	.286	.286	.272	.291	.109	.296	.225	.225	.225	.413	.366
12.0	46.3	53.4	28.8	2.6	.0554	.287	.301	.301	.301	.326	.314	.306	.175	.297	.257	.257	.257	.338	.297
13.0	47.1	55.0	28.9	1.8	.0352	.301	.344	.341	.318	.306	.318	.321	.149	.264	.245	.264	.283	.379	.379
14.0	46.9	55.5	28.5	7.2	.1564	.316	.326	.319	.304	.311	.330	.374	.200	.274	.274	.274	.311	.423	.385
15.0	47.0	56.1	28.0	5.8	.0759	.325	.386	.372	.329	.336	.354	.368	.179	.286	.286	.286	.286	.393	.358
16.0	46.9	56.9	27.5	6.6	.1697	.342	.437	.400	.369	.369	.349	.342	.267	.267	.301	.301	.301	.369	.369
17.0	47.4	58.2	27.4	-.2	-.0026	.349	.438	.431	.389	.376	.363	.341	.263	.263	.328	.293	.293	.392	.360
18.0	47.8	59.7	26.6	2.9	.0490	.360	.427	.415	.400	.391	.369	.381	.215	.261	.381	.336	.306	.381	.412
19.0	48.5	61.5	26.3	-.6	-.0085	.369	.410	.404	.393	.415	.401	.413	.240	.296	.381	.353	.325	.381	.381
20.0	48.0	61.3	26.3	8.3	.1483	.380	.429	.386	.401	.418	.449	.481	.235	.249	.321	.349	.378	.435	.406
21.0	48.3	62.6	25.7	2.7	.0377	.388	.462	.457	.454	.459	.470	.476	.259	.232	.286	.313	.367	.421	.394
22.0	48.0	62.8	25.3	8.2	.0861	.395	.464	.459	.467	.467	.472	.483	.232	.232	.312	.339	.392	.419	.392
23.0	48.1	63.4	25.4	4.2	.0592	.403	.495	.479	.445	.466	.477	.479	.232	.245	.351	.351	.390	.429	.403
24.0	48.0	64.2	24.8	5.3	.0716	.411	.485	.463	.465	.460	.460	.452	.283	.283	.359	.359	.384	.435	.460
25.0	47.9	65.0	24.2	5.1	.0667	.419	.479	.470	.455	.460	.492	.499	.318	.318	.342	.367	.367	.428	.453
26.0	47.8	65.5	24.0	5.3	.0672	.426	.488	.479	.474	.474	.483	.462	.325	.349	.373	.397	.373	.421	.445
COMMENCE VALVE CLOSURE																			
27.0	48.1	66.7	23.5	2.0	.0223	.432	.507	.470	.465	.460	.451	.428	.351	.363	.375	.409	.432	.467	.444
28.0	46.8	65.6	23.8	9.2	.2088	.441	.534	.520	.494	.487	.450	.457	.365	.341	.341	.388	.412	.482	.459
VALVE FULLY CLOSED																			
29.0	46.9	67.3	21.5	.7	.0147	.445	.525	.505	.481	.481	.488	.492	.355	.333	.355	.376	.420	.485	.485
30.0	49.4	71.6	21.7	-12.4	-.2802	.445	.495	.487	.489	.459	.463	.467	.377	.357	.387	.397	.437	.487	.477
31.0	50.9	74.1	21.9	-6.8	-.1543	.445	.496	.482	.469	.461	.469	.463	.333	.352	.428	.428	.448	.486	.467
32.0	51.6	75.2	22.0	-2.9	-.0656	.445	.483	.481	.475	.462	.458	.471	.372	.372	.428	.428	.438	.475	.438
33.0	51.9	75.7	22.1	-1.4	-.0322	.445	.471	.473	.469	.462	.465	.469	.387	.387	.424	.424	.443	.462	.443
34.0	52.1	76.0	22.1	-.7	-.0159	.445	.469	.465	.467	.462	.465	.465	.410	.391	.428	.437	.428	.456	.437
35.0	52.1	76.0	22.1	0.0	0.0000	.445	.473	.469	.466	.466	.471	.473	.397	.397	.434	.415	.415	.453	.453
36.0	52.1	76.0	22.1	0.0	0.0000	.445	.471	.469	.458	.462	.465	.465	.406	.406	.425	.425	.425	.452	.452
37.0	52.1	76.0	22.1	0.0	0.0000	.445	.468	.468	.471	.462	.464	.468	.405	.405	.423	.423	.423	.460	.442
38.0	51.9	75.7	22.1	.7	.0159	.445	.467	.465	.476	.467	.468	.481	.401	.401	.420	.420	.420	.457	.439
39.0	51.7	75.5	22.1	.7	.0160	.445	.465	.467	.477	.467	.467	.478	.396	.396	.415	.415	.433	.452	.452
40.0	51.6	75.2	22.0	.7	.0161	.445	.467	.464	.467	.466	.467	.471	.396	.405	.424	.424	.424	.462	.443
41.0	51.4	74.9	22.0	.7	.0163	.445	.473	.473	.465	.463	.469	.476	.399	.418	.418	.418	.418	.456	.437
42.0	51 4	74.8	22.1	0.0	0.0000	.445	.473	.473	.469	.467	.471	.476	.395	.414	414	.414	.433	.452	.433
43.0	51.2	73.8	23.0	.7	.0164	.445	.472	.472	.468	.466	.468	.472	.393	.403	.422	.422	.422	.472	.432
44.0	51.1	72.9	23.8	.7	.0165	.445	.468	.468	.466	.470	.468	.474	.395	.395	.415	.415	.415	.497	.435
45.0	51.1	72.3	24.5	0.0	0.0000	.445	.468	.468	.468	.473	.473	.479	.389	.410	410	.410	.410	.493	.431
46.0	50.9	71.6	25.1	.7	.0166	.445	.464	.464	.467	.469	.471	.482	.402	.424	.402	.402	.402	.488	.445
47.0	50.7	70.7	25.8	.7	.0167	.445	.459	.461	.461	.465	.467	.483	.396	.418	396	.407	.418	.496	.452
48.0	50.7	70.4	26.2	0.0	0.0000	.445	.453	.465	.458	.469	.465	.478	.390	.424	390	.406	424	.496	.462
49.0	50.7	69 9	26.8	0.0	0.0000	.445	.453	.458	.455	.471	.460	.476	.383	.430	.383	.407	.430	.499	.476
50.0	50.6	69.1	27.4	.7	.0168	.445	.449	.456	.456	.473	.459	.475	396	.420	396	.420	.420	.492	.468

Table 18B — Inferred Pressurant Distribution, Scaling Run 246; South 3.279-cm Nozzle

t (s)	$\tilde{T}$ (°C)	$\tilde{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations I: I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	16.2	16.2	25.3	.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	18.0	17.9	22.0	93.4	1.8204	.019	.519	.324	.079	.177	.275	.397	-.409	-.165	-.165	-.165	-.287	-.165	-.165
VALVE FULLY OPEN																			
2.0	21.6	21.8	19.2	10.7	.4138	.056	-.957	-.685	-.259	-.453	-.724	-.918	.980	.787	.399	.593	.593	.787	.593
3.0	25.0	26.0	14.4	-4.8	-.1662	.089	-.078	-.027	-.018	-.044	-.112	-.112	.324	.239	.153	.153	.196	.239	.239
4.0	27.3	29.4	11.5	1.2	.0402	.118	.002	.030	.030	.030	.019	.025	.204	.260	.176	.148	.148	.232	.232
5.0	28.9	32.2	9.9	3.2	.1028	.146	.088	.097	.106	.110	.083	.056	.222	.222	.177	.133	.155	.222	.222
6.0	30.6	35.0	9.1	.8	.0234	.169	.115	.127	.127	.135	.135	.131	.204	.224	.166	.166	.165	.262	.224
7.0	32.0	37.5	8.8	2.6	.0740	.192	.183	.190	.172	.169	.155	.162	.218	.218	.183	.183	.165	.252	.252
8.0	32.6	39.0	8.7	6	.1658	.214	.225	.228	.221	.215	.198	.208	.225	.208	.175	.175	.208	.258	.241
9.0	33.4	40.8	8.8		.1002	.234	.259	.244	.247	.231	.222	.219	.206	.206	.206	.206	.222	.300	.269
10.0	34.2	42.8	8.8		.0544	.251	.307	.289	.275	.245	.245	.230	.177	.222	.222	.222	.236	.310	.281
11.0	35.0	44.5	8.9		.0535	.267	.297	.297	.281	.275	.264	.244	.205	.205	.261	.261	.275	.317	.289
12.0	36.1	46.4	9.0		-.0582	.275	.303	.314	.319	.303	.282	.255	.191	.164	.271	.271	.264	.325	.298
13.0	36.8	48.0	9.1	2.0	.0402	.290	.295	.300	.303	.303	.287	.272	.226	.213	.290	.303	.316	.341	.316
14.0	36.9	49.1	9.2	4.8	.0972	.304	.334	.344	.339	.326	.326	.319	.196	.221	.296	.296	.309	.321	.321
15.0	36.7	49.5	9.3	7.2	.1489	.318	.344	.354	.364	.352	.354	.359	.217	.205	.292	.305	.317	.342	.329
16.0	36.2	49.5	9.4	8.7	.1784	.332	.366	.378	.366	.364	.378	.381	.231	.231	.306	.306	.319	.356	.331
17.0	36.0	49.9	9.5	7.0	.1254	.344	.381	.378	.381	.363	.378	.388	.227	.240	.314	.326	.351	.376	.363
18.0	36.3	50.9	9.7	4.0	.0644	.354	.387	.389	.396	.382	.374	.374	.258	.282	.331	.331	.367	.379	.355
19.0	36.4	51.5	9.8	3.8	.0390	.361	.391	.384	.375	.382	.375	.384	.293	.293	.341	.341	.353	.389	.369
20.0	37.2	53.2	9.9	-2.0	-.0267	.369	.387	.399	.399	.392	.387	.382	.299	.322	.346	.346	.357	.403	.392
21.0	37.3	54.0	9.9	3.8	.0557	.379	.419	.399	.388	.406	.394	.397	.230	.313	.358	.358	.392	.403	.40[illegible]
22.0	37.0	54.2	10.0	7.3	.1111	.388	.435	.403	.383	.392	.424	.437	.281	.338	.360	.372	.394	.417	.406
23.0	36.6	54.1	10.0	8.5	.1278	.397	.445	.445	.434	.439	.449	.448	.291	.268	.359	.359	.416	.427	.387
24.0	36.4	54.4	10.1	6.0	.0792	.405	.466	.459	.457	.450	.457	.459	.263	.297	.364	.364	.410	.432	.387
25.0	36.8	55.4	10.1	1.2	.0138	.412	.470	.463	.450	.450	.449	.452	.247	.291	.379	.401	.434	.445	.423
26.0	36.0	54.7	10.1	13.2	.1391	.418	.472	.474	.467	.472	.463	.429	.234	.301	.391	.413	.425	.458	.430
27.0	36.5	55.9	10.2	-1.1	-.0122	.424	.457	.465	.468	.476	.470	.479	.267	.321	.398	.399	.409	.474	.441
28.0	37.0	57.2	10.2	-1.8	-.0177	.430	.459	.465	.463	.476	.462	.463	.297	.340	.425	.425	.414	.446	.446
COMMENCE VALVE CLOSURE																			
29.0	36.1	56.2	10.2	12.4	.1739	.438	.512	.497	.476	.465	.473	.510	.315	.358	.391	.402	.413	.434	.445
30.0	36.0	56.7	10.2	2.5	.0489	.444	.497	.495	.491	.485	.485	.487	.332	.353	.418	.418	.407	.439	.461
VALVE FULLY CLOSED																			
31.0	35.8	56.7	10.1	3.2	.0638	.449	.516	.512	.489	.491	.489	.512	.332	.364	.407	.418	.418	.439	.450
32.0	37.4	59.6	10.1	-9.9	-.1951	.449	.519	.500	.494	.490	.492	.492	.324	.385	.426	.426	.416	.426	.446
33.0	38.0	60.7	10.2	-3.8	-.0740	.449	.499	.497	.487	.483	.471	.477	.357	.396	.436	.436	.426	.436	.436
34.0	38.5	61.5	10.2	-2.7	-.0541	.449	.497	.497	.489	.487	.487	.483	.349	.378	.417	.426	.436	.456	.436
35.0	38.8	62.1	10.2	-1.8	-.0354	.449	.500	.494	.485	.479	.481	.467	.359	.379	.417	.437	.446	.456	.437
36.0	39.0	62.4	10.2	-.9	-.0175	.449	.489	.489	.483	.479	.481	.464	.370	.370	.427	.427	.446	.466	.446
37.0	39.0	62.4	10.2	0.0	0.0000	.449	.485	.483	.482	.478	.474	.472	.359	.378	.416	.436	.445	.474	.455
38.0	39.0	62.4	10.2	0.0	0.0000	.449	.472	.475	.475	.477	.479	.475	.379	.370	.427	.427	.447	.475	.456
39.0	38.8	62.1	10.2	.9	.0175	.449	.465	.469	.470	.476	.474	.472	.382	.363	.420	.440	.449	.497	.459
40.0	38.8	62.1	10.2	0.0	0.0000	.449	.465	.467	.458	.467	.463	.456	.390	.381	.438	.438	.458	.496	.459
41.0	38.6	61.8	10.2	.9	.0176	.449	.464	.458	.444	.452	.452	.456	.410	.390	.448	.448	.458	.487	.468
42.0	38.5	61.5	10.2	.9	.0178	.449	.468	.462	.453	.451	.459	.459	.406	.406	.445	.445	.455	.484	.445
43.0	38.5	61.5	10.2	0.0	0.0000	.449	.471	.467	.461	.443	.455	.465	.404	.395	.443	.443	.443	.482	.447
44.0	38.3	61.2	10.2	.9	.0179	.449	.476	.471	.467	.447	.453	.465	.402	.402	.441	.441	.451	.480	.441
45.0	38.3	61.2	10.2	0.0	0.0000	.449	.467	.459	.465	.449	.447	.453	.412	.402	.451	.431	.461	.490	.451
46.0	38.2	61.0	10.2	.9	.0180	.449	.475	.471	.463	.457	.453	.453	.409	.408	.447	.426	.438	.487	.447
47.0	38.0	60.7	10.2	.9	.0182	.449	.475	.473	.469	.465	.459	.449	.420	.400	.439	.420	.449	.479	.439
48.0	38.0	60.7	10.2	0.0	0.0000	.449	.475	.471	.469	.467	.467	.467	.413	.394	.433	.433	.433	.473	.433
49.0	38.0	60.7	10.2	0.0	0.0000	.449	.472	.468	.466	.468	.464	.466	.426	.406	.426	.426	.436	.486	.436
50.0	37.8	60.4	10.2	.9	.0183	.449	.476	.472	.470	.476	.462	.470	.422	.402	.422	.402	.442	.482	.442

Table 19B — Inferred Pressurant Distribution, Scaling Run 247; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	Pressurant Fractions (X) at Locations l: l = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	18.9	18.9	77.3	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	20.1	20.0	20.4	106.2	1.2449	.012	.213	.129	.070	.106	.165	.225	-.134	-.014	-.134	-.134	-.074	-.134	-.134
VALVE FULLY OPEN																			
2.0	23.3	23.2	25.2	33.7	1.4809	.054	1.308	.962	.764	.271	.715	1.011	-.865	-.618	-.618	-.865	-.124	-.618	-.618
3.0	27.0	27.7	20.3	-4.4	-.1564	.087	-.220	-.166	-.139	-.099	-.180	-.193	.641	.372	.237	.237	.036	.237	.372
4.0	29.6	31.1	18.5	1.4	.0473	.118	-.062	-.031	-.007	-.015	-.055	-.070	.292	.292	.253	.214	.174	.253	.292
5.0	31.4	33.9	16.6	4.3	.1395	.146	.059	.053	.030	.042	.030	.030	.232	.232	.290	.232	.213	.232	.237
6.0	33.2	36.7	16.3	2.0	.0613	.172	.151	.126	.121	.102	.056	.082	.258	.209	.234	.234	.165	.209	.256
7.0	34.5	39.1	15.2	3.7	.1045	.195	.184	.196	.192	.151	.096	.171	.217	.217	.217	.217	.196	.217	.259
8.0	35.4	40.7	15.3	1.9	.0334	.209	.191	.191	.167	.167	.151	.167	.226	.226	.226	.265	.206	.265	.265
9.0	36.8	43.2	14.9	.6	.0156	.226	.190	.204	.190	.194	.183	.186	.222	.240	.257	.257	.222	.310	.310
10.0	37.2	44.8	14.0	6.1	.1587	.240	.252	.255	.265	.268	.265	.272	.190	.223	.223	.223	.207	.288	.288
11.0	37.5	46.2	13.7	5.7	.1395	.266	.304	.297	.288	.276	.257	.223	.208	.223	.239	.254	.270	.300	.316
12.0	37.8	47.2	13.7	6.2	.1386	.282	.319	.316	.274	.295	.269	.298	.188	.248	.277	.248	.262	.337	.337
13.0	38.9	49.4	13.8	-.7	-.0142	.296	.363	.374	.332	.326	.292	.304	.183	.225	.281	.281	.253	.323	.309
14.0	39.7	51.2	14.0	1.0	.0184	.309	.355	.355	.347	.347	.335	.331	.137	.223	.331	.304	.290	.304	.301
15.0	40.3	52.7	14.1	2.3	.0421	.322	.309	.327	.324	.363	.371	.371	.190	.215	.319	.319	.332	.371	.371
16.0	39.7	52.7	14.1	9.2	.1955	.336	.393	.406	.390	.372	.380	.357	.123	.201	.305	.331	.318	.383	.409
17.0	40.0	53.5	14.2	2.3	.0251	.343	.414	.407	.397	.381	.341	.315	.142	.244	.320	.320	.333	.422	.422
18.0	40.7	55.1	14.3	.4	.0065	.353	.409	.406	.424	.375	.343	.348	.176	.225	.348	.346	.348	.421	.421
19.0	41.1	56.3	14.4	2.4	.0377	.363	.445	.426	.412	.414	.424	.426	.199	.199	.363	.367	.331	.367	.367
20.0	40.5	56.2	14.4	8.5	.1555	.375	.415	.410	.386	.408	.422	.423	.185	.269	.377	.377	.377	.401	.413
21.0	39.5	55.3	14.4	11.7	.2137	.386	.393	.408	.410	.415	.425	.420	.205	.303	.376	.400	.412	.425	.425
22.0	39.6	55.9	14.4	5.0	.0732	.395	.422	.420	.420	.422	.417	.427	.205	.302	.386	.410	.410	.446	.446
23.0	39.0	55.7	14.4	9.7	.1529	.404	.464	.445	.450	.435	.450	.450	.198	.309	.382	.406	.394	.454	.430
24.0	39.4	56.6	14.5	-1.6	-.0120	.409	.449	.439	.446	.442	.449	.444	.230	.325	.420	.420	.408	.420	.420
25.0	39.3	57.0	14.5	6.1	.0832	.417	.487	.477	.470	.465	.482	.496	.237	.296	.402	.402	.390	.413	.402
26.0	39.8	58.3	14.6	-1.4	-.0146	.423	.499	.506	.508	.480	.483	.501	.261	.283	.398	.398	.364	.398	.421
27.0	39.8	58.7	14.7	5.4	.0676	.430	.492	.497	.488	.497	.492	.494	.279	.279	.392	.415	.404	.426	.439
COMMENCE VALVE CLOSURE																			
28.0	39.9	59.5	14.7	2.5	.0280	.436	.470	.472	.468	.484	.481	.497	.280	.325	.414	.437	.426	.437	.481
29.0	40.1	60.0	14.7	1.6	.0189	.441	.474	.463	.466	.479	.466	.463	.289	.333	.444	.444	.455	.466	.488
VALVE FULLY CLOSED																			
30.0	39.2	59.2	14.6	13.5	.1587	.448	.478	.478	.472	.467	.476	.512	.297	.319	.431	.442	.454	.487	.510
31.0	41.6	63.3	14.8	-23.9	-.2818	.448	.472	.467	.457	.474	.507	.503	.278	.360	.422	.443	.453	.484	.505
32.0	42.9	65.5	15.0	-11.7	-.1383	.448	.461	.457	.463	.479	.475	.494	.310	.370	.429	.449	.439	.479	.479
33.0	43.5	66.6	15.1	-5.6	-.0664	.448	.464	.462	.458	.470	.481	.437	.380	.390	.439	.439	.440	.458	.458
34.0	43.9	67.1	15.2	-2.8	-.0326	.448	.471	.467	.459	.469	.478	.486	.392	.382	.430	.421	.450	.469	.450
35.0	44.0	67.4	15.2	-1.4	-.0161	.448	.474	.470	.464	.470	.474	.480	.380	.388	.426	.426	.436	.464	.464
36.0	44.2	67.7	15.2	-1.4	-.0160	.448	.475	.469	.463	.469	.473	.477	.383	.393	.421	.440	.431	.460	.479
37.0	44.2	67.7	15.2	0.0	0.0000	.448	.476	.474	.462	.468	.474	.478	.388	.398	.445	.436	.426	.455	.455
38.0	44.0	67.4	15.2	1.4	.0160	.448	.465	.461	.456	.459	.469	.471	.406	.406	.444	.444	.435	.444	.463
39.0	43.9	67.1	15.2	1.4	.0161	.448	.472	.462	.454	.464	.468	.475	.402	.383	.450	.450	.431	.450	.460
40.0	43.9	67.1	15.2	0.0	0.0000	.448	.464	.462	.456	.458	.462	.469	.396	.377	.473	.454	.444	.454	.454
41.0	43.7	66.9	15.1	1.4	.0162	.448	.466	.459	.453	.455	.460	.470	.399	.379	.466	.466	.437	.457	.457
42.0	43.5	66.6	15.1	1.4	.0163	.448	.453	.453	.443	.445	.453	.463	.418	.379	.476	.457	.442	.476	.457
43.0	43.5	66.6	15.1	0.0	0.0000	.448	.448	.446	.436	.438	.450	.460	.409	.390	.467	.467	.459	.487	.467
44.0	43.4	66.3	15.1	1.4	.0164	.448	.450	.441	.433	.435	.447	.460	.413	.384	.472	.472	.462	.492	.462
45.0	43.2	66.0	15.1	1.4	.0165	.448	.445	.437	.430	.431	.439	.451	.418	.398	.477	.477	.467	.496	.457
46.0	43.2	66.0	15.1	0.0	0.0000	.448	.446	.436	.432	.440	.442	.451	.416	.396	.475	.475	.465	.495	.451
47.0	43.0	65.8	15.1	1.4	.0167	.448	.447	.439	.445	.445	.449	.457	[illegible]	.392	.471	.471	.461	.433	.471
48.0	43.0	65.8	15.1	0.0	0.0000	.448	.451	.443	.449	.445	.449	.455	.405	.405	.464	.464	.455	.484	.455
49.0	42.9	65.5	15.0	1.4	.0168	.448	.449	.443	.449	.443	.449	.453	.415	.396	.475	.455	.445	.495	.451
50.0	42.9	65.5	15.0	0.0	0.0000	.448	.454	.450	.450	.454	.454	.456	.411	.391	.470	.450	.440	.490	[illegible]

Table 20B — Inferred Pressurant Distribution, Scaling Run 248; South 3.279-cm Nozzle

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	1	2	3	4	5	6	7	8	9	10	11	12	13
																			Pressurant Fractions (X) at Locations I
COMMENCE VALVE OPENING																			
0.0	22.7	22.7	49.6	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	26.2	25.9	39.9	-66.0	-1.5370	.016	.246	.246	.203	.217	.266	.266	-.198	-.163	-.163	-.163	-.163	-.198	-.163
VALVE FULLY OPEN																			
2.0	29.2	29.9	33.2	14.8	.6401	.059	.575	.621	.645	.575	.691	.621	-.756	-.756	-.289	-.289	-.056	-.522	-.289
3.0	31.4	31.4	31.3	10.6	.4209	.096	-10.601	-10.69	-13.29	-11.27	-15.97	-14.6321	64314	926 8	208 4	850 4	85014	926 8	208
4.0	33.8	34.5	29.3	2.0	.0656	.126	-.250	-.231	-.269	-.231	-.307	-.250	.727	.535	.344	.344	.344	.535	.344
5.0	35.6	36.9	28.3	3.9	.1251	.153	.019	.042	-.004	.042	.042	.030	.376	.376	.203	.146	.146	.433	.146
6.0	37.6	39.7	27.9	.5	.0133	.178	.151	.142	.151	.117	.100	.134	.337	.337	.253	.166	.083	.252	.083
7.0	39.2	42.2	27.1	1.0	.0277	.199	.244	.218	.211	.192	.158	.178	.264	.264	.198	.165	.132	.198	.165
8.0	40.3	44.1	26.8	3.1	.0842	.221	.286	.240	.182	.171	.159	.200	.257	.315	.257	.200	.290	.200	.200
9.0	40.9	45.4	26.3	3.9	.0667	.234	.287	.251	.214	.209	.193	.219	.246	.246	.246	.246	.193	.298	.193
10.0	41.4	46.7	25.9	5.3	.1320	.253	.293	.269	.250	.250	.226	.245	.264	.216	.216	.216	.264	.312	.264
11.0	42.0	48.2	25.4	4.4	.1060	.270	.306	.258	.263	.276	.311	.328	.197	.197	.241	.241	.241	.328	.328
12.0	42.1	49.1	24.9	6.5	.1473	.287	.314	.331	.318	.306	.316	.310	.244	.244	.264	.244	.223	.326	.285
13.0	42.6	50.3	24.7	4.5	.0956	.302	.367	.348	.324	.321	.309	.328	.219	.258	.297	.258	.258	.336	.297
14.0	42.3	50.7	24.2	8.2	.1767	.316	.349	.345	.356	.352	.341	.360	.209	.247	.266	.266	.303	.375	.341
15.0	42.8	52.1	23.7	3.8	.0728	.329	.378	.357	.374	.385	.413	.367	.192	.262	.262	.262	.297	.402	.332
16.0	43.1	53.2	23.2	2.4	.0269	.337	.362	.352	.345	.358	.345	.372	.318	.318	.295	.318	.352	.385	.352
17.0	43.8	54.9	23.2	.8	.0133	.346	.422	.356	.339	.352	.356	.35[illegible]	.257	.295	.324	.352	.352	.400	.352
18.0	43.5	55.2	22.7	7.9	.1478	.360	.403	.391	.365	.394	.472	.400	.231	.282	.261	.354	.354	.415	.365
19.0	43.1	55.2	22.7	8.3	.1416	.371	.422	.416	.419	.443	.468	.446	.185	.247	.306	.339	.370	.400	.354
20.0	43.7	57.0	22.9	1.0	.0135	.379	.457	.460	.449	.483	.497	.497	.189	.237	.294	.323	.351	.386	.323
21.0	43.8	57.8	21.8	4.6	.0668	.388	.459	.459	.459	.467	.472	.461	.226	.281	.337	.351	.364	.364	.351
22.0	44.2	59.3	21.3	1.7	.0225	.397	.453	.437	.429	.453	.455	.448	.279	.332	.358	.385	.358	.385	.365
23.0	43.5	58.7	21.2	12.0	.1411	.404	.434	.437	.429	.442	.464	.456	.293	.320	.373	.347	.400	.426	.426
24.0	43.9	60.0	20.7	1.8	.0216	.411	.472	.469	.408	.447	.457	.482	.327	.340	.378	.378	.378	.416	.391
25.0	43.5	60.4	20.2	8.1	.1123	.419	.484	.467	.460	.455	.472	.479	.365	.340	.365	.390	.390	.390	.390
26.0	43.8	61.4	20.0	1.8	.0212	.426	.496	.487	.467	.465	.470	.474	.356	.356	.368	.392	.368	.405	.429
27.0	43.1	61.3	19.4	10.6	.1481	.434	.492	.492	.487	.490	.499	.497	.349	.349	.397	.397	.373	.397	.420
28.0	42.8	61.0	19.5	10.1	.0864	.438	.546	.520	.498	.496	.486	.479	.320	.344	.392	.392	.368	.416	.440
COMMENCE VALVE CLOSURE																			
29.0	43.1	62.2	19.[illegible]	.6	.0056	.444	.536	.501	.473	.480	.470	.473	.326	.361	.407	.407	.419	.454	.466
30.0	42.8	62.7	18.6	4.7	.0845	.450	.538	.529	.493	.499	.502	.502	.316	.364	.409	.409	.409	.454	.437
VALVE FULLY CLOSED																			
31.0	42.1	62.1	18.3	6.8	.1220	.456	.524	.519	.508	.524	.506	.515	.330	.376	.398	.410	.410	.467	.444
32.0	44.1	65.5	18.5	-13.2	-.2371	.456	.516	.516	.499	.503	.522	.535	.339	.382	.403	.425	.425	.446	.425
33.0	45.1	67.2	18.7	-6.1	-.1107	.456	.501	.501	.491	.499	.507	.526	.334	.386	.427	.437	.437	.447	.437
34.0	45.5	68.0	18.7	-3.0	-.0536	.456	.502	.500	.480	.492	.496	.506	.331	.392	.433	.433	.453	.453	.453
35.0	45.7	68.3	18.7	-1.0	-.0176	.456	.511	.497	.486	.501	.501	.503	.361	.382	.422	.422	.442	.462	.442
36.0	45.9	68.6	18.8	-1.0	-.0175	.456	.505	.495	.489	.499	.497	.495	.354	.384	.425	.435	.435	.465	.455
37.0	45.9	68.6	18.6	0.0	0.0000	.456	.514	.502	.494	.488	.484	.480	.361	.401	.442	.421	.442	.462	.442
38.0	45.7	68.3	18.7	1.0	.0175	.456	.513	.503	.485	.473	.479	.481	.378	.398	.438	.436	.438	.459	.448
39.0	45.7	68.3	18.7	0.0	0.0000	.456	.501	.493	.477	.473	.477	.479	.390	.390	.431	.451	.451	.471	.451
40.0	45.5	68.0	18.7	1.0	.0176	.456	.500	.488	.478	.474	.484	.482	.383	.389	.429	.449	.449	.470	.449
41.0	45.4	67.8	18.7	1.0	.0177	.456	.495	.487	.481	.470	.479	.477	.401	.411	.442	.442	.442	.462	.442
42.0	45.4	67.8	18.7	0.0	0.0000	.456	.489	.483	.475	.475	.485	.493	.395	.416	.436	.436	.436	.456	.456
43.0	45.2	67.5	18.7	1.0	.0179	.456	.488	.482	.470	.472	.488	.502	.392	.412	.433	.433	.443	.463	.453
44.0	45.1	66.3	19.7	1.0	.0180	.456	.490	.479	.472	.474	.483	.492	.404	.425	.425	.425	.447	.468	.447
45.0	45.1	65.7	20.5	0.0	0.0000	.456	.490	.479	.483	.474	.483	.501	.408	.419	.430	.430	.430	.463	.441
46.0	44.9	64.9	21.0	1.0	.0181	.456	.489	.478	.471	.480	.485	.492	.408	.430	.453	.430	.430	.453	.430
47.0	44.9	64.4	21.6	0.0	0.0000	.456	.492	.480	.466	.478	.485	.487	.424	.424	.448	.424	.424	.448	.448
48.0	44.7	63.7	22.2	1.0	.0183	.456	.493	.483	.474	.488	.491	.488	.418	.418	.442	.418	.418	.455	.442
49.0	44.7	63.2	22.7	0.0	0.0000	.456	.495	.487	.475	.492	.495	.500	.406	.431	.431	.406	.431	.455	.431
50.0	44.6	62.5	23.2	1.0	.0184	.456	.498	.488	.483	.496	.496	.514	.397	.422	.435	.409	.422	.446	.422

C-Tables

Each of the four sets of experiments has a C-table. These tables give mean values for replicate runs in each set. Otherwise, they are similar to the B-tables, with two exceptions: Dimensionless time τ is added in the last column of the table, and all values in the table have been extrapolated to correspond to equal τ-increments of 0.05 (see Appendix C for program).

Set 1, Table C — Mean Values of All Quantities, Scaling Runs 230-236

MEAN VALUES OF ALL QUANTITIES

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	MEAN PRESSURANT FRACTIONS AT LOCATIONS I: 1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.0	12.5	12.5	27.4	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.4	14.6	14.9	18.1	5.5	.2499	.023	-.104	-.053	.022	-.008	-.057	-.055	.124	.054	.046	.089	.046	.104	.085	.05
.8	16.6	17.2	9.1	9.2	.4092	.046	-.196	-.098	.042	-.012	-.106	-.102	.239	.103	.091	.172	.093	.201	.164	.10
1.1	18.2	19.4	5.0	9.0	.5521	.069	-.140	-.061	.054	.011	-.070	-.061	.243	.122	.115	.188	.108	.208	.173	.15
1.4	19.7	21.5	3.3	7.6	.5315	.091	-.065	-.012	.063	.038	-.017	.003	.227	.142	.134	.190	.121	.194	.168	.20
1.6	21.1	23.7	2.4	5.9	.4725	.114	.010	.038	.073	.065	.036	.067	.209	.161	.153	.193	.134	.180	.164	.25
1.9	22.4	25.8	1.7	4.6	.4163	.137	.074	.081	.087	.093	.084	.123	.198	.182	.171	.199	.150	.172	.164	.30
2.3	23.7	28.0	1.5	4.0	.3621	.159	.106	.109	.109	.120	.116	.155	.212	.203	.192	.214	.173	.185	.179	.35
2.7	25.0	30.3	1.5	3.4	.2945	.182	.137	.135	.130	.148	.145	.182	.229	.223	.214	.230	.197	.203	.197	.40
3.1	26.0	32.4	1.5	3.5	.2786	.205	.167	.164	.155	.175	.174	.209	.245	.242	.235	.244	.220	.222	.216	.45
3.5	27.0	34.5	1.6	3.8	.2842	.228	.198	.196	.183	.200	.202	.233	.256	.256	.253	.259	.241	.246	.241	.50
3.9	27.9	36.7	1.6	4.0	.2848	.251	.230	.226	.212	.226	.230	.257	.268	.270	.270	.275	.261	.270	.265	.55
4.4	28.7	39.0	1.6	3.7	.2400	.274	.262	.257	.243	.254	.261	.286	.281	.284	.285	.293	.283	.290	.279	.60
5.0	29.6	41.4	1.5	3.4	.1954	.297	.293	.287	.274	.285	.293	.316	.291	.302	.302	.308	.303	.307	.293	.65
5.6	30.1	43.5	1.4	3.7	.1992	.319	.319	.314	.302	.315	.324	.344	.309	.323	.324	.323	.319	.321	.312	.70
6.3	30.5	45.6	1.4	4.1	.2024	.342	.345	.339	.326	.340	.349	.370	.332	.343	.345	.343	.342	.343	.331	.75
7.1	30.8	47.6	1.4	4.1	.1859	.365	.372	.366	.347	.362	.372	.393	.354	.362	.364	.367	.365	.366	.351	.80
8.0	30.8	49.4	1.6	4.3	.1784	.387	.399	.392	.370	.382	.393	.414	.375	.387	.392	.391	.392	.364	.366	.85
9.0	30.9	51.3	1.6	4.0	.1472	.410	.418	.414	.400	.409	.419	.440	.393	.414	.409	.408	.411	.408	.391	.90
10.2	30.7	53.0	1.5	3.6	.1428	.433	.445	.438	.419	.429	.442	.463	.421	.437	.436	.427	.432	.429	.413	.95
11.9	29.6	54.6	-.1	1.2	.0757	.456	.474	.462	.443	.455	.469	.487	.445	.454	.456	.451	.448	.449	.437	1.00
13.1	30.7	56.7	-.4	-1.8	-.1098	.456	.476	.468	.450	.461	.474	.493	.444	.448	.448	.444	.445	.443	.436	1.05
14.4	30.4	56.2	-.3	.6	.0331	.456	.477	.472	.456	.464	.479	.493	.441	.448	.447	.440	.442	.438	.432	1.10
15.7	30.1	55.5	-.2	.6	.0341	.456	.478	.470	.457	.465	.481	.496	.445	.446	.446	.441	.438	.435	.432	1.15
16.9	29.8	55.0	-.1	.6	.0342	.456	.483	.475	.459	.470	.482	.495	.442	.446	.441	.435	.437	.431	.433	1.20
18.2	29.6	54.4	-.1	.5	.0321	.456	.484	.477	.461	.469	.481	.496	.441	.443	.442	.434	.438	.433	.433	1.25
19.4	29.3	53.9	.0	.5	.0296	.456	.484	.475	.461	.469	.478	.494	.438	.442	.442	.438	.436	.437	.437	1.30
20.7	29.1	53.4	.1	.4	.0256	.456	.484	.474	.458	.468	.478	.493	.437	.443	.442	.436	.439	.437	.442	1.35
22.0	28.9	53.0	.2	.4	.0236	.456	.484	.475	.457	.467	.479	.495	.441	.445	.438	.433	.438	.437	.440	1.40
23.2	28.7	52.6	.2	.4	.0239	.456	.483	.474	.457	.467	.476	.493	.441	.445	.445	.436	.436	.439	.437	1.45
24.5	28.5	52.3	.3	.3	.0199	.456	.480	.471	.455	.465	.474	.494	.443	.447	.445	.436	.438	.441	.440	1.50
25.7	28.3	51.9	.3	.4	.0234	.456	.479	.469	.455	.464	.474	.492	.441	.449	.446	.437	.441	.442	.439	1.55
27.0	28.2	51.6	.3	.3	.0183	.456	.478	.468	.453	.465	.476	.493	.444	.447	.447	.440	.439	.442	.437	1.60
28.3	28.1	51.3	.4	.3	.0189	.456	.478	.469	.455	.466	.478	.493	.444	.449	.449	.437	.438	.441	.435	1.65
29.5	27.9	50.9	.5	.4	.0221	.456	.479	.470	.455	.465	.479	.495	.444	.448	.446	.437	.436	.442	.434	1.70
30.8	27.8	50.4	.8	.2	.0116	.456	.481	.470	.455	.467	.482	.500	.443	.446	.440	.433	.438	.440	.435	1.75
27.1	23.6	42.9	1.0	.3	.0159	.394	.410	.403	.394	.402	.412	.426	.384	.382	.382	.378	.382	.382	.380	1.80
28.2	23.5	42.4	1.3	.2	.0132	.394	.411	.405	.395	.403	.412	.426	.384	.382	.381	.377	.379	.364	.381	1.85
14.5	11.8	21.3	.6	.1	.0081	.197	.205	.204	.199	.205	.209	.214	.190	.190	.189	.186	.189	.192	.189	1.90
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 2, Table C — Mean Values of All Quantities, Scaling Runs 237-240

MEAN VALUES OF ALL QUANTITIES

t (s)	$\bar{T}$ (°C)	$\bar{T}_s$ (°C)	$\bar{T}_e$ (°C)	β	β/θ	$\bar{X}$	MEAN PRESSURANT FRACTIONS AT LOCATIONS I: 1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.0	17.7	17.7	30.8	.8	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
1.0	19.7	19.6	27.8	65.7	1.9414	.023	.364	.242	-.006	.119	.252	.380	-.138	-.090	-.202	-.196	-.109	-.162	-.140	.05
1.6	22.1	22.0	24.7	40.1	1.0014	.045	-.797	-.766	-.738	-.625	-.861	-1.006	.814	.640	.697	.725	.536	.969	.796	.10
2.3	24.2	24.5	22.2	3.9	.1489	.068	-1.079	-.907	-.838	-.765	-1.101	-1.327	1.058	1.052	.926	.965	.700	1.250	1.026	.15
2.9	26.2	26.9	18.9	1.3	.0480	.090	-.580	-.518	-.474	-.474	-.574	-.604	.844	.614	.442	.691	.427	.765	.613	.20
3.7	27.9	29.4	16.7	1.6	.0529	.113	-.354	-.304	-.281	-.289	-.339	-.359	.666	.481	.344	.513	.336	.597	.456	.25
4.5	29.5	31.8	15.1	2.1	.0671	.135	.017	.025	.029	.021	.011	-.014	.285	.244	.201	.213	.192	.317	.219	.30
5.3	31.1	34.2	14.3	1.5	.0495	.158	.108	.089	.092	.091	.074	.063	.201	.209	.224	.217	.199	.281	.206	.35
6.3	32.6	36.8	13.6	1.2	.0354	.180	.170	.153	.153	.156	.143	.126	.191	.192	.201	.196	.180	.263	.225	.40
7.4	34.0	39.3	13.3	1.8	.0492	.203	.211	.201	.196	.195	.192	.180	.192	.198	.198	.209	.184	.251	.231	.45
8.5	35.0	41.4	13.0	3.5	.0935	.226	.246	.233	.223	.211	.212	.213	.196	.219	.224	.223	.214	.273	.244	.50
9.9	35.6	43.1	12.9	5.5	.1117	.248	.258	.257	.247	.245	.250	.251	.204	.228	.243	.41	.235	.300	.268	.55
11.2	36.4	45.2	12.8	3.1	.0730	.271	.282	.280	.275	.278	.279	.287	.208	.237	.270	.259	.257	.315	.290	.60
12.7	36.8	46.8	12.9	5.8	.1337	.293	.314	.303	.299	.308	.318	.328	.203	.257	.284	.284	.274	.334	.310	.65
14.3	37.4	48.6	12.8	4.0	.0767	.316	.345	.345	.339	.344	.342	.321	.236	.262	.304	.305	.301	.341	.323	.70
16.2	37.6	50.2	12.9	4.4	.0814	.338	.375	.363	.358	.346	.345	.343	.256	.274	.333	.344	.325	.383	.352	.75
18.3	37.7	51.7	12.8	5.4	.0884	.361	.395	.390	.381	.371	.381	.370	.265	.292	.357	.349	.346	.410	.381	.80
20.6	37.4	52.7	12.8	6.9	.1112	.383	.409	.411	.407	.414	.418	.413	.280	.319	.365	.369	.363	.418	.401	.85
23.4	37.5	54.5	12.7	5.6	.0846	.406	.439	.431	.421	.419	.409	.403	.306	.358	.408	.405	.409	.443	.427	.90
26.6	37.2	55.6	12.6	7.5	.0986	.428	.451	.447	.440	.442	.443	.449	.336	.360	.430	.424	.424	.473	.453	.95
30.3	36.3	56.5	11.7	2.2	.0462	.451	.494	.486	.474	.482	.486	.486	.374	.376	.443	.432	.427	.458	.444	1.00
34.3	39.9	62.8	12.0	-1.4	-.0306	.451	.483	.475	.466	.461	.465	.470	.382	.402	.450	.445	.443	.471	.450	1.05
38.4	39.9	62.9	12.0	.3	.0081	.451	.464	.459	.457	.459	.465	.465	.393	.404	.457	.452	.449	.478	.460	1.10
42.5	39.5	61.8	12.2	.5	.0114	.451	.462	.458	.458	.463	.465	.473	.398	.405	.451	.453	.453	.475	.450	1.15
46.5	39.1	60.5	13.1	.5	.0126	.451	.463	.460	.455	.461	.463	.477	.411	.411	.449	.7	.445	.475	.444	1.20
50.6	38.8	59.5	13.7	.3	.0067	.451	.466	.464	.460	.465	.461	.466	.411	.422	.439	.433	.445	.478	.451	1.25
54.7	38.5	58.6	14.1	.5	.0106	.451	.467	.464	.461	.469	.462	.464	.410	.423	.436	.439	.441	.487	.436	1.30
58.7	38.3	57.9	14.4	.2	.0049	.451	.469	.464	.460	.461	.457	.463	.414	.439	.438	.442	.438	.483	.437	1.35
62.7	38.1	57.3	14.6	.3	.0060	.451	.466	.463	.456	.464	.464	.467	.417	.425	.434	.440	.444	.484	.436	1.40
66.8	37.8	56.7	14.9	.5	.0143	.451	.467	.464	.462	.468	.467	.473	.413	.418	.434	.436	.444	.477	.439	1.45
70.9	37.7	56.3	15.0	.3	.0065	.451	.467	.464	.460	.466	.464	.472	.420	.436	.425	.436	.446	.465	.439	1.50
75.0	37.5	56.0	15.1	.0	.0007	.451	.458	.453	.450	.459	.461	.463	.437	.441	.429	.432	.452	.484	.442	1.55
79.0	37.3	55.5	15.1	.6	.0112	.451	.453	.458	.452	.461	.453	.459	.433	.439	.428	.445	.450	.493	.439	1.60
83.1	37.1	55.2	15.1	.3	.0065	.451	.456	.456	.450	.458	.452	.458	.437	.445	.439	.439	.439	.495	.438	1.65
87.2	37.0	54.9	15.1	.2	.0045	.451	.453	.453	.453	.458	.455	.457	.445	.450	.439	.440	.444	.487	.431	1.70
91.2	36.8	54.6	15.1	.5	.0094	.451	.454	.454	.448	.459	.453	.459	.441	.447	.447	.447	.447	.477	.429	1.75
44.8	18.0	28.4	5.4	.3	.0061	.226	.226	.228	.228	.229	.226	.227	.226	.226	.226	.223	.221	.229	.226	1.80
46.7	18.0	28.4	5.4	.1	.0029	.226	.225	.227	.226	.229	.223	.225	.223	.223	.223	.229	.226	.240	.223	1.85
48.5	17.9	28.2	5.4	0.0	0.0000	.226	.224	.225	.227	.229	.224	.225	.222	.222	.222	.228	.228	.242	.222	1.90
24.7	9.2	14.4	3.0	0.0	0.0000	.113	.112	.112	.113	.114	.114	.115	.112	.112	.112	.112	.112	.118	.112	1.95
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 3, Table C — Mean Values of All Quantities, Scaling Runs 241-244

MEAN VALUES OF ALL QUANTITIES

t (s)	$\bar{T}$ (°C)	$\bar{T}_e$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	MEAN PRESSURANT FRACTIONS AT LOCATIONS I 1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.0	5.9	5.9	35.8	2.1	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.5	7.2	7.6	17.1	27.2	1.3294	.023	-.118	-.021	.272	.001	-.075	-.075	.007	-.040	-.044	-.014	.015	.319	.071	.05
.9	8.4	9.2	-.1	48.9	2.5245	.046	-.217	-.038	.514	.004	-.136	-.136	.016	-.071	-.080	-.023	.030	.597	.137	.10
1.1	9.6	11.0	-4.5	43.6	2.4937	.069	-.184	-.020	.535	.021	-.108	-.104	.032	-.047	-.057	-.005	.040	.633	.161	.15
1.4	10.7	12.8	-7.3	35.0	2.3039	.092	-.136	.003	.527	.040	-.070	-.062	.047	-.017	-.027	.016	.048	.649	.176	.20
1.6	11.9	14.6	-8.1	23.7	1.8117	.115	-.089	.026	.516	.063	-.031	-.020	.063	.016	.004	.039	.060	.650	.196	.25
1.9	13.0	16.4	-8.3	13.7	1.3012	.138	-.049	.050	.510	.086	.007	.024	.078	.048	.033	.060	.074	.659	.213	.30
2.3	13.9	18.1	-7.7	11.1	1.0137	.161	-.026	.076	.526	.112	.041	.062	.090	.072	.053	.075	.100	.685	.225	.35
2.6	14.8	19.8	-7.1	9.4	.8071	.184	.000	.105	.541	.134	.075	.101	.102	.096	.072	.089	.125	.713	.234	.40
3.0	15.7	21.5	-6.5	8.5	.6858	.207	.030	.140	.560	.152	.105	.134	.115	.118	.089	.103	.162	.741	.236	.45
3.4	16.6	23.2	-5.8	7.8	.5899	.230	.066	.190	.589	.166	.133	.166	.129	.138	.105	.117	.179	.766	.241	.50
3.8	17.3	25.0	-5.3	7.1	.4947	.253	.099	.234	.618	.185	.162	.196	.145	.157	.128	.137	.187	.787	.250	.55
4.4	18.1	26.8	-4.9	6.3	.4047	.276	.131	.244	.649	.212	.200	.228	.165	.183	.152	.159	.204	.799	.261	.60
4.9	18.7	28.6	-4.5	6.1	.3588	.299	.161	.249	.678	.237	.233	.260	.191	.210	.173	.179	.227	.813	.277	.65
5.6	19.1	30.2	-4.2	6.2	.3438	.322	.191	.266	.698	.251	.253	.280	.219	.230	.199	.201	.253	.821	.322	.70
6.2	19.4	31.7	-4.0	6.3	.3225	.345	.222	.289	.714	.264	.270	.294	.255	.256	.226	.226	.287	.832	.346	.75
7.0	19.5	33.2	-3.8	6.3	.2894	.368	.255	.308	.732	.284	.283	.308	.290	.289	.260	.253	.326	.847	.350	.80
7.9	19.8	34.9	-3.7	5.4	.2226	.391	.287	.348	.742	.305	.319	.362	.308	.307	.284	.274	.340	.859	.348	.85
9.1	19.7	36.2	-3.7	6.0	.2039	.414	.314	.367	.761	.335	.356	.391	.322	.341	.312	.314	.363	.868	.337	.90
10.5	19.6	37.7	-3.9	5.7	.1886	.437	.351	.381	.767	.360	.386	.408	.354	.366	.338	.336	.397	.867	.369	.95
12.5	19.4	41.0	-6.1	-1.3	-.0881	.460	.428	.449	.617	.414	.432	.442	.392	.407	.386	.381	.432	.731	.449	1.00
14.1	19.9	42.1	-6.2	-.7	-.0364	.460	.470	.450	.456	.429	.466	.484	.429	.445	.429	.429	.439	.598	.457	1.05
15.6	19.5	41.3	-6.1	.9	.0503	.460	.488	.455	.441	.446	.484	.503	.433	.452	.439	.434	.432	.543	.431	1.10
17.2	19.2	40.6	-6.0	.7	.0386	.460	.495	.459	.433	.451	.491	.506	.434	.450	.437	.434	.434	.539	.419	1.15
18.7	18.9	40.0	-5.8	.5	.0330	.460	.499	.460	.431	.457	.498	.511	.432	.452	.434	.427	.425	.537	.418	1.20
20.3	18.7	39.4	-5.8	.5	.0317	.460	.499	.459	.429	.457	.497	.512	.436	.454	.437	.431	.429	.524	.415	1.25
21.8	18.5	38.9	-5.7	.5	.0303	.460	.500	.459	.426	.455	.494	.509	.438	.457	.438	.432	.429	.530	.415	1.30
23.4	18.2	38.5	-5.6	.4	.0246	.460	.498	.456	.422	.451	.492	.506	.440	.459	.445	.434	.427	.528	.420	1.35
24.9	18.1	38.1	-5.5	.4	.0200	.460	.501	.460	.426	.454	.497	.510	.434	.453	.439	.434	.428	.524	.419	1.40
26.5	17.9	37.6	-5.4	.6	.0319	.460	.502	.461	.429	.456	.497	.511	.432	.450	.436	.431	.431	.528	.420	1.45
28.0	17.7	37.3	-5.3	.2	.0125	.460	.502	.458	.423	.453	.495	.511	.437	.450	.439	.428	.429	.532	.421	1.50
29.6	17.6	36.9	-5.3	.4	.0200	.460	.505	.459	.427	.458	.494	.511	.432	.455	.432	.427	.427	.531	.423	1.55
31.1	17.4	36.6	-5.2	.5	.0280	.460	.503	.460	.430	.460	.496	.508	.435	.460	.428	.422	.422	.535	.420	1.60
15.2	10.5	20.4	-1.3	.1	.0062	.228	.262	.227	.204	.230	.260	.265	.216	.230	.219	.213	.209	.222	.206	1.65
16.0	10.4	20.2	-1.2	.2	.0167	.228	.265	.227	.202	.228	.259	.266	.215	.229	.218	.212	.212	.221	.209	1.70
8.1	5.3	10.1	-.7	.1	.0069	.112	.144	.114	.075	.113	.135	.141	.105	.120	.109	.103	.097	.107	.094	1.75
8.4	5.3	10.0	-.7	.1	.0067	.112	.144	.114	.074	.113	.136	.141	.104	.119	.109	.102	.096	.112	.093	1.80
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 4, Table C — Mean Values of All Quantities, Scaling Runs 245-248

MEAN VALUES OF ALL QUANTITIES

t (s)	$\bar{T}$ (°C)	$\bar{T}_a$ (°C)	$\bar{T}_p$ (°C)	β	β/θ	$\bar{X}$	1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
							MEAN PRESSURANT FRACTIONS AT LOCATIONS I													
0.0	21.0	21.0	51.0	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
1.1	23.6	23.4	33.2	43.8	.8498	.022	.333	.252	.160	.159	.239	.296	-.247	-.135	-.153	-.163	-.127	-.174	-.148	.05
1.7	25.5	25.4	30.5	24.6	.7239	.045	.354	.313	.322	.199	.290	.312	-.268	-.208	-.179	-.193	-.015	-.164	-.157	.10
2.3	27.6	27.6	27.8	9.7	.4189	.067	-.169	-.188	-.360	-.368	-.561	-.494	.937	.597	.305	.086	.224	.627	.242	.15
2.9	29.6	30.0	25.5	1.8	.0804	.090	-1.148	-1.207	-1.995	-1.680	-2.478	-2.235	3.539	2.423	1.355	.623	.594	2.399	.980	.20
3.7	31.4	32.4	23.9	2.3	.0852	.112	-.504	-.536	-.910	-.768	-1.138	-1.038	1.777	1.277	.734	.370	.368	1.257	.571	.25
4.5	33.0	34.7	22.5	2.4	.0782	.135	-.073	-.058	-.072	-.041	-.076	-.088	.434	.372	.247	.200	.214	.377	.318	.30
5.4	34.5	37.0	21.7	2.5	.0795	.157	.042	.064	.026	.058	.044	.052	.315	.303	.213	.176	.173	.331	.250	.35
6.3	36.0	39.3	21.2	2.1	.0660	.180	.131	.127	.137	.127	.098	.118	.268	.273	.202	.183	.155	.284	.233	.40
7.3	37.4	41.6	20.6	2.7	.0734	.202	.195	.190	.171	.168	.141	.161	.258	.260	.200	.195	.181	.256	.253	.45
8.6	38.4	43.7	20.2	3.8	.0871	.225	.234	.221	.194	.197	.194	.208	.242	.251	.228	.216	.205	.281	.248	.50
9.8	39.2	45.6	19.8	4.8	.1203	.247	.275	.262	.247	.245	.239	.244	.208	.226	.219	.222	.237	.310	.279	.55
11.1	40.1	47.7	19.5	3.3	.0828	.270	.295	.286	.281	.280	.277	.273	.181	.226	.245	.246	.256	.339	.322	.60
12.7	41.0	50.1	19.1	3.0	.0633	.292	.326	.327	.312	.315	.301	.302	.202	.248	.278	.271	.269	.336	.310	.65
14.3	41.5	51.9	19.0	5.2	.1083	.315	.362	.343	.341	.342	.344	.353	.199	.238	.288	.287	.306	.365	.344	.70
16.1	41.[illegible]	53.2	18.6	6.3	.1244	.337	.391	.381	.363	.361	.368	.365	.203	.256	.302	.318	.324	.380	.367	.75
18.3	42.[illegible]	55.4	18.5	3.8	.0610	.359	.415	.406	.399	.395	.391	.389	.229	.259	.332	.341	.340	.393	.384	.80
20.7	42.3	57.2	18.1	6.6	.1115	.382	.428	.414	.411	.425	.435	.442	.236	.285	.350	.363	.380	.403	.394	.85
23.4	41.9	58.3	17.7	6.0	.0825	.404	.470	.460	.441	.449	.459	.467	.253	.295	.366	.373	.394	.432	.403	.90
26.6	41.9	60.4	17.1	3.7	.0510	.427	.483	.484	.479	.478	.484	.486	.305	.324	.390	.398	.383	.423	.435	.95
30.3	41.0	61.3	16.1	6.1	.0898	.450	.511	.503	.488	.491	.490	.508	.329	.348	.398	.412	.426	.470	.472	1.00
34.7	45.2	68.4	16.6	-1.5	-.0251	.450	.486	.482	.475	.478	.480	.479	.375	.381	.425	.427	.442	.465	.449	1.05
39.2	45.1	68.2	16.6	.7	.0111	.450	.476	.470	.463	.464	.468	.469	.401	.394	.438	.441	.440	.466	.454	1.10
43.6	44.6	67.0	17.0	.4	.0080	.450	.470	.464	.461	.457	.462	.472	.407	.407	.443	.437	.440	.474	.448	1.15
48.1	44.1	65.3	18.2	.6	.0111	.450	.473	.468	.467	.472	.470	.479	.405	.408	.434	.422	.433	.479	.438	1.20
52.6	43.8	63.9	19.1	.1	.0023	.450	.468	.472	.467	.479	.475	.481	.401	.405	.427	.420	.430	.475	.443	1.25
57.0	43.5	62.7	20.0	.3	.0045	.450	.467	.465	.464	.475	.469	.484	.399	.403	.430	.428	.442	.474	.444	1.30
61.5	43.3	61.5	20.8	.7	.0107	.450	.457	.458	.458	.467	.469	.471	.407	.418	.432	.432	.439	.494	.441	1.35
65.9	43.0	60.5	21.6	.3	.0043	.450	.463	.459	.451	.459	.458	.460	.425	.425	.429	.434	.444	.489	.450	1.40
70.4	42.8	59.5	22.2	.6	.0089	.450	.462	.462	.455	.459	.452	.464	.421	.435	.431	.427	.442	.493	.442	1.45
74.9	42.6	58.8	22.7	.7	.0105	.450	.462	.456	.454	.461	.457	.464	.435	.435	.426	.428	.443	.480	.442	1.50
79.3	42.4	58.2	22.8	.3	.0047	.450	.460	.456	.451	.459	.462	.466	.437	.431	.424	.435	.438	.487	.437	1.55
83.8	42.2	57.8	23.0	.0	.0010	.450	.452	.448	.444	.456	.460	.473	.432	.437	.434	.438	.438	.487	.445	1.60
88.2	42.0	57.4	23.1	.1	.0018	.450	.448	.443	.439	.451	.460	.473	.432	.438	.438	.438	.438	.492	.455	1.65
92.7	41.9	57.1	23.2	.1	.0026	.450	.444	.443	.433	.446	.454	.468	.436	.436	.437	.445	.442	.489	.469	1.70
45.9	22.3	29.7	13.2	.0	.0007	.223	.220	.218	.216	.222	.223	.229	.218	.222	.218	.228	.215	.234	.234	1.75
22.8	12.1	14.9	8.6	0.0	.0001	.111	.109	.108	.106	.111	.111	.116	.107	.117	.107	.117	.107	.117	.117	1.80
23.7	12.1	14.8	8.7	0.0	0.0000	.111	.108	.110	.109	.114	.110	.112	.108	.118	.118	.108	.108	.118	.108	1.85
24.7	12.0	14.7	8.7	0.0	0.0000	.111	.109	.109	.110	.117	.109	.112	.116	.116	.116	.105	.105	.116	.108	1.90
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

D-Tables

The D-tables give the standard-deviation history of each local mean pressurant mole fraction, according to experimental set, for values of dimensionless time τ from 0.00 to 2.45 (see Appendix C for program). Each experimental set is treated in a separate D-table.

Set 1, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 230-236

LOCATIONS I													
1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.271	.160	.051	.099	.157	.142	.203	.085	.100	.133	.096	.172	.138	.05
.505	.297	.096	.184	.290	.264	.384	.158	.193	.245	.181	.318	.253	.10
.380	.228	.088	.155	.219	.195	.294	.118	.169	.197	.147	.246	.197	.15
.270	.172	.078	.125	.164	.142	.213	.078	.132	.158	.116	.186	.154	.20
.162	.120	.076	.096	.114	.097	.143	.056	.100	.121	.094	.129	.115	.25
.092	.084	.075	.072	.081	.069	.107	.064	.078	.095	.084	.084	.091	.30
.084	.077	.057	.058	.075	.061	.100	.060	.072	.084	.067	.069	.081	.35
.072	.071	.040	.047	.065	.053	.094	.061	.064	.075	.051	.059	.072	.40
.063	.069	.032	.042	.057	.049	.089	.058	.059	.072	.040	.053	.064	.45
.054	.061	.024	.039	.055	.056	.085	.049	.053	.071	.035	.048	.063	.50
.052	.051	.020	.037	.055	.058	.079	.041	.050	.065	.032	.050	.067	.55
.050	.039	.013	.027	.046	.050	.063	.032	.038	.064	.039	.056	.056	.60
.043	.028	.014	.021	.038	.044	.060	.036	.032	.062	.047	.063	.042	.65
.038	.025	.013	.019	.035	.042	.069	.033	.031	.052	.040	.059	.032	.70
.035	.016	.012	.014	.030	.035	.062	.024	.032	.047	.028	.054	.040	.75
.032	.014	.011	.013	.031	.028	.057	.025	.039	.044	.025	.049	.041	.80
.036	.014	.013	.013	.029	.025	.056	.033	.044	.045	.028	.046	.033	.85
.026	.026	.018	.021	.027	.038	.057	.031	.044	.057	.033	.066	.030	.90
.032	.025	.017	.021	.029	.027	.054	.030	.031	.052	.029	.051	.040	.95
.023	.021	.024	.021	.024	.022	.043	.028	.035	.046	.031	.044	.043	1.00
.028	.016	.014	.013	.019	.017	.049	.029	.034	.044	.021	.043	.048	1.05
.036	.028	.016	.018	.017	.024	.043	.028	.030	.050	.028	.045	.050	1.10
.033	.029	.015	.013	.016	.028	.051	.031	.030	.043	.032	.052	.048	1.15
.026	.020	.014	.011	.021	.031	.055	.035	.032	.040	.031	.043	.052	1.20
.021	.020	.020	.021	.024	.034	.049	.027	.032	.042	.033	.050	.050	1.25
.028	.023	.017	.022	.030	.035	.054	.037	.036	.051	.029	.055	.049	1.30
.033	.029	.017	.022	.028	.032	.059	.035	.038	.053	.032	.055	.049	1.35
.028	.025	.015	.020	.025	.027	.051	.026	.038	.053	.038	.043	.052	1.40
.031	.021	.012	.013	.021	.025	.054	.031	.039	.045	.029	.042	.053	1.45
.027	.019	.010	.010	.015	.027	.048	.021	.024	.042	.037	.049	.051	1.50
.033	.020	.008	.012	.018	.026	.043	.026	.041	.047	.026	.054	.052	1.55
.032	.016	.016	.015	.017	.028	.049	.028	.036	.039	.030	.047	.052	1.60
.031	.022	.020	.022	.024	.031	.051	.031	.036	.039	.031	.059	.048	1.65
.026	.026	.019	.026	.032	.030	.057	.036	.042	.054	.032	.046	.046	1.70
.030	.023	.013	.022	.030	.036	.054	.030	.046	.057	.035	.045	.052	1.75
.368	.362	.353	.361	.369	.382	.344	.343	.343	.339	.343	.342	.342	1.80
.369	.363	.353	.362	.369	.382	.345	.342	.342	.338	.339	.344	.342	1.85
.519	.516	.505	.520	.528	.541	.481	.480	.479	.472	.479	.487	.479	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 2, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 237-240

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.202	.051	.334	.047	.162	.175	.027	.001	.083	.043	.034	.474	.078	.05
.348	.093	.591	.093	.280	.303	.050	.137	.145	.076	.068	.822	.149	.10
.304	.091	.545	.079	.255	.278	.049	.109	.122	.061	.069	.695	.152	.15
.254	.086	.479	.055	.231	.254	.048	.080	.093	.039	.067	.554	.146	.20
.203	.083	.421	.035	.211	.234	.048	.060	.071	.026	.059	.446	.142	.25
.166	.076	.372	.026	.191	.209	.050	.047	.055	.017	.053	.375	.134	.30
.152	.062	.339	.028	.172	.180	.043	.043	.050	.024	.074	.377	.122	.35
.151	.072	.307	.033	.152	.156	.038	.039	.041	.036	.093	.374	.120	.40
.157	.086	.283	.043	.139	.152	.031	.040	.029	.039	.102	.364	.128	.45
.160	.051	.273	.044	.137	.150	.026	.046	.018	.023	.055	.342	.137	.50
.156	.020	.263	.052	.139	.147	.025	.050	.028	.011	.043	.330	.133	.55
.137	.032	.244	.046	.125	.130	.025	.037	.039	.017	.054	.298	.145	.60
.131	.034	.232	.036	.110	.119	.023	.034	.044	.024	.058	.281	.154	.65
.133	.021	.226	.014	.109	.118	.028	.045	.043	.014	.048	.279	.141	.70
.120	.015	.239	.010	.105	.090	.023	.055	.036	.021	.052	.281	.087	.75
.107	.035	.249	.021	.088	.087	.021	.074	.044	.021	.052	.269	.087	.80
.099	.042	.221	.032	.086	.099	.036	.058	.041	.024	.043	.246	.062	.85
.105	.024	.217	.034	.101	.096	.028	.031	.042	.023	.047	.233	.081	.90
.084	.035	.200	.014	.080	.099	.025	.030	.025	.008	.035	.214	.062	.95
.095	.080	.315	.073	.072	.084	.018	.036	.060	.057	.021	.134	.081	1.00
.077	.036	.157	.033	.071	.073	.023	.030	.034	.041	.038	.104	.121	1.05
.070	.018	.144	.014	.068	.071	.025	.006	.021	.031	.043	.173	.065	1.10
.071	.023	.156	.013	.060	.067	.015	.016	.021	.020	.029	.193	.063	1.15
.069	.031	.157	.015	.048	.068	.009	.025	.025	.019	.033	.175	.065	1.20
.071	.020	.155	.010	.058	.070	.029	.017	.016	.011	.036	.179	.041	1.25
.070	.019	.157	.012	.058	.063	.028	.019	.027	.021	.047	.153	.049	1.30
.067	.018	.159	.012	.062	.060	.028	.022	.015	.012	.043	.170	.053	1.35
.064	.021	.168	.012	.067	.071	.024	.027	.020	.012	.049	.173	.056	1.40
.064	.028	.174	.014	.073	.072	.027	.025	.016	.012	.036	.177	.051	1.45
.071	.025	.168	.010	.067	.075	.023	.027	.008	.015	.039	.182	.040	1.50
.064	.021	.167	.015	.064	.069	.020	.040	.014	.013	.040	.182	.052	1.55
.071	.022	.175	.025	.064	.073	.013	.034	.018	.007	.037	.196	.051	1.60
.572	.494	.471	.501	.567	.578	.470	.502	.476	.464	.455	.483	.450	1.65
.579	.493	.465	.496	.564	.580	.468	.500	.474	.462	.464	.481	.459	1.70
.543	.429	.282	.426	.509	.531	.397	.452	.409	.386	.364	.404	.354	1.75
.542	.430	.279	.428	.511	.531	.393	.448	.412	.382	.360	.423	.349	1.80
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 3, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 241-244

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.461	.297	.055	.232	.409	.519	.171	.210	.487	.496	.194	.305	.176	.05
2.345	2.254	1.930	1.717	2.446	3.016	1.969	1.949	1.975	1.990	1.418	2.497	1.980	.10
2.737	2.643	2.292	2.031	2.895	3.524	2.310	2.305	2.298	2.330	1.696	2.940	2.339	.15
1.457	1.321	1.268	1.266	1.346	1.313	1.769	1.004	.718	1.425	.719	1.347	1.046	.20
1.243	1.133	1.098	1.087	1.175	1.215	1.558	.874	.561	1.158	.624	1.267	.945	.25
.141	.138	.163	.138	.137	.202	.271	.098	.015	.063	.089	.294	.112	.30
.086	.114	.118	.082	.100	.103	.035	.065	.082	.095	.114	.177	.052	.35
.049	.036	.017	.014	022	.020	.063	.078	.041	.038	.036	.097	.036	.40
.082	.051	.039	.031	022	.032	.051	.061	.051	.035	.061	.039	.058	.45
.059	.016	.028	.042	045	.018	.016	.039	.039	.025	.018	.059	.045	.50
.017	.031	.043	.042	.043	.027	.027	.050	.014	.007	.026	.082	.048	.55
.017	.014	.036	.025	.011	.045	.052	.024	.039	.018	.028	.044	.044	.60
.040	.028	.031	.037	.039	.023	.095	.062	.012	.021	.040	.031	.033	.65
.029	.040	.030	.032	.040	.007	.092	.079	.011	.028	.025	.049	.025	.70
.056	.037	.044	.043	.031	.047	.040	.026	.027	.041	.043	.069	.025	.75
.031	.029	.019	.054	.017	.024	.020	.020	.026	.047	.037	.021	.049	.80
.036	.032	.035	.043	.041	.040	.018	.040	.046	.058	.049	.045	.048	.85
.054	.026	.020	.022	.039	.045	.018	.038	.026	.014	.018	.030	.010	.90
.021	.021	.031	.024	.049	.063	.038	.039	.031	.018	.022	.076	.057	.95
.029	.024	.020	.016	.025	.045	.045	.070	.052	.031	.027	.044	.047	1.00
.019	.022	.021	.007	.008	.018	.025	.047	.029	.016	.024	.013	.030	1.05
.027	.009	.019	.017	.013	.014	.019	.050	.018	.035	.029	.020	.009	1.10
.005	.008	.017	.006	.010	.006	.027	.042	.011	.024	.014	.018	.012	1.15
.018	.016	.008	.018	.022	.022	.028	.041	.032	.028	.035	.037	.017	1.20
.010	.006	.017	.034	.032	.028	.044	.027	.056	.047	.029	.018	.024	1.25
.022	.011	.020	.038	.043	.039	.038	.024	.068	.045	.044	.030	.017	1.30
.027	.026	.017	.032	.033	.038	.025	.030	.051	.060	.062	.019	.033	1.35
.039	.034	.020	.019	.019	.028	.027	.026	.037	.034	.034	.038	.043	1.40
.030	.017	.020	.029	.036	.020	.021	.028	.021	.025	.036	.034	.054	1.45
.048	.026	.024	.025	.018	.018	.042	.021	.026	032	.050	.033	.053	1.50
.023	.012	.009	.018	023	.018	.024	.033	.044	.046	.028	.066	.038	1.55
.015	.015	.012	.038	024	.023	029	.040	.052	.025	.031	.051	.042	1.60
.015	.007	.007	.031	.022	.027	.030	.013	.029	.029	.029	.032	.057	1.65
.020	.014	.012	.021	.027	.019	.008	.019	.042	.016	.041	.035	.052	1.70
.010	.013	.030	.013	.006	.021	.016	.028	.035	.009	.009	.054	.063	1.75
.500	.505	.506	.508	.501	.503	.502	.502	.502	.494	.489	.508	.501	1.80
.499	.503	.502	.507	.495	.499	.495	.495	.495	.507	.501	.532	.495	1.85
.497	.504	.503	.509	.497	.499	.493	.493	.493	.505	.505	.536	.493	1.90
.430	.430	.435	.439	.437	.442	.432	.432	.432	.432	.432	.453	.432	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

Set 4, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 245-248

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.251	.150	.202	.132	.158	.185	.156	.151	.158	.215	.122	.165	.164	.05
1.257	.955	.655	.621	.926	1.127	1.103	.938	.592	.845	.449	.894	.716	.10
3.208	3.014	3.441	2.905	4.132	3.890	5.483	3.670	2.161	1.515	1.534	3.841	2.452	.15
11.231	11.012	12.643	10.747	15.074	13.898	20.263	13.954	7.671	5.018	5.062	14.006	8.702	.20
5.498	5.357	6.103	5.189	7.248	6.629	9.751	6.699	3.702	2.535	2.503	6.714	4.174	.25
.242	.240	.266	.205	.233	.250	.447	.282	.095	.108	.101	.323	.267	.30
.166	.100	.193	.112	.111	.067	.202	.183	.078	.075	.061	.232	.219	.35
.109	.102	.061	.036	.072	.064	.096	.126	.076	.060	.082	.185	.190	.40
.097	.075	.083	.049	.060	.069	.096	.104	.041	.059	.041	.106	.121	.45
.080	.046	.062	.033	.039	.044	.057	.068	.055	.063	.027	.040	.083	.50
.045	.026	.044	.024	.029	.030	.070	.021	.011	.009	.042	.032	.031	.55
.040	.034	.019	.005	.046	.077	.089	.069	.031	.032	.040	.085	.050	.60
.049	.047	.015	.013	.029	.035	.054	.064	.030	.042	.060	.014	.023	.65
.020	.022	.046	.044	.026	.016	.022	.055	.057	.043	.011	.076	.051	.70
.032	.041	.042	.017	.027	.026	.103	.093	.012	.035	.047	.023	.056	.75
.036	.032	.030	.028	.060	.044	.079	.065	.067	.030	.052	.020	.020	.80
.045	.060	.062	.057	.057	.057	.073	.051	.041	.035	.031	.051	.058	.85
.021	.025	.040	.025	.023	.031	.109	.078	.038	.048	.025	.029	.038	.90
.033	.032	.033	.019	.022	.024	.073	.057	.041	.022	.037	.054	.025	.95
.043	.035	.030	.047	.024	.020	.046	.051	.061	.053	.038	.043	.060	1.00
.033	.025	.024	.032	.027	.028	.030	.012	.004	.008	.007	.003	.013	1.05
.029	.024	.026	.011	.021	.020	.008	.018	.022	.023	.030	.035	.019	1.10
.032	.029	.037	.031	.032	.039	.011	.027	.040	.042	.035	.033	.024	1.15
.038	.037	.027	.040	.038	.048	.025	.020	.045	.057	.038	.040	.025	1.20
.035	.031	.015	.035	.045	.043	.020	.029	.053	.039	.018	.040	.034	1.25
.042	.027	.011	.018	.018	.042	.023	.020	.015	.032	.019	.022	.029	1.30
.036	.021	.010	.019	.020	.027	.025	.022	.015	.015	.021	.051	.030	1.35
.024	.022	.006	.018	.008	.025	.027	.008	.016	.017	.039	.072	.028	1.40
.015	.031	.017	.018	.020	.025	.018	.029	.021	.027	.045	.058	.038	1.45
.016	.011	.019	.021	.010	.028	.031	.031	.041	.047	.049	.032	.014	1.50
.029	.018	.011	.019	.027	.026	.020	.035	.048	.052	.040	.029	.038	1.55
.025	.010	.012	.015	.017	.031	.012	.024	.037	.023	.015	.051	.021	1.60
.019	.010	.016	.007	.017	.021	.017	.026	.024	.024	.019	.056	.015	1.65
.012	.011	.019	.012	.006	.023	.021	.021	.027	.012	.025	.052	.035	1.70
.489	.486	.481	.494	.497	.511	.487	.495	.487	.508	.479	.521	.521	1.75
.419	.415	.407	.427	.427	.446	.411	.450	.412	.449	.411	.450	.450	1.80
.414	.422	.418	.440	.426	.433	.414	.454	.454	.416	.414	.454	.416	1.85
.419	.421	.425	.449	.421	.432	.445	.445	.445	.405	.405	.445	.414	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

E-Tables

These tables give the local mean pressurant fraction deviations for dimensionless-time values 0.00 to 2.45. By pressurant-fraction deviation, we mean the ratio of the difference between the local pressurant and the mean pressurant fraction at time t to the mean pressurant fraction at the time of valve closure, $t = t_c$. As in the D-tables, these values are given at equal intervals of dimensionless time τ (see Appendix C for program).

Set 1, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 230-236

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
-.278	-.165	-.003	-.067	-.175	-.170	.221	.067	.051	.144	.055	.179	.137	.05
-.329	-.315	-.008	-.127	-.333	-.325	.425	.127	.100	.277	.103	.340	.260	.10
-.458	-.284	-.033	-.126	-.304	-.285	.382	.118	.102	.261	.087	.306	.229	.15
-.343	-.227	-.062	-.117	-.238	-.193	.297	.112	.093	.217	.066	.226	.169	.20
-.227	-.168	-.090	-.107	-.170	-.102	.208	.102	.085	.173	.044	.146	.109	.25
-.138	-.122	-.108	-.096	-.115	-.029	.135	.101	.076	.137	.029	.078	.061	.30
-.117	-.111	-.111	-.087	-.096	-.011	.115	.096	.072	.121	.030	.056	.044	.35
-.100	-.103	-.114	-.075	-.081	-.001	.102	.088	.070	.105	.033	.045	.033	.40
-.083	-.090	-.110	-.066	-.068	.008	.086	.080	.066	.086	.032	.037	.024	.45
-.066	-.070	-.098	-.060	-.057	.012	.061	.061	.055	.068	.028	.040	.028	.50
-.047	-.054	-.085	-.055	-.045	.013	.039	.041	.043	.053	.023	.041	.031	.55
-.027	-.038	-.067	-.043	-.027	.028	.016	.022	.026	.042	.019	.035	.011	.60
-.007	-.021	-.050	-.026	-.007	.042	-.012	.011	.012	.026	.013	.024	-.007	.65
-.002	-.013	-.038	-.010	.009	.055	-.022	.008	.010	.008	-.000	.004	-.016	.70
.006	-.007	-.035	-.004	.017	.061	-.022	.003	.007	.002	.001	.002	-.024	.75
.016	.003	-.039	-.006	.017	.061	-.023	-.005	-.001	.005	.002	.004	-.030	.80
.026	.010	-.038	-.012	.013	.059	-.028	-.001	.009	.007	.010	-.007	-.047	.85
.017	.008	-.023	-.003	.019	.064	-.039	.008	-.003	-.005	.002	-.004	-.042	.90
.026	.011	-.031	-.008	.019	.066	-.026	.009	.006	-.014	-.003	-.009	-.044	.95
.040	.013	-.029	-.001	.028	.069	-.025	-.005	.001	-.011	-.017	-.015	-.042	1.00
.044	.027	-.013	.010	.039	.080	-.027	-.017	-.017	-.027	-.025	-.028	-.043	1.05
.047	.034	-.001	.018	.051	.081	-.032	-.018	-.019	-.034	-.031	-.039	-.053	1.10
.048	.031	.002	.020	.054	.088	-.025	-.021	-.022	-.034	-.039	-.045	-.053	1.15
.060	.042	.007	.031	.057	.086	-.032	-.023	-.032	-.046	-.042	-.055	-.050	1.20
.060	.045	.011	.028	.054	.087	-.033	-.029	-.030	-.048	-.040	-.051	-.049	1.25
.061	.042	.010	.028	.048	.084	-.040	-.030	-.031	-.040	-.044	-.042	-.041	1.30
.060	.039	.005	.026	.048	.081	-.042	-.028	-.032	-.043	-.036	-.041	-.031	1.35
.062	.041	.003	.024	.050	.086	-.034	-.025	-.039	-.051	-.039	-.041	-.034	1.40
.059	.039	.003	.025	.044	.081	-.033	-.023	-.025	-.043	-.043	-.038	-.041	1.45
.053	.032	-.002	.020	.040	.084	-.029	-.019	-.025	-.044	-.039	-.032	-.034	1.50
.051	.029	-.003	.018	.040	.079	-.032	-.015	-.023	-.042	-.032	-.030	-.037	1.55
.047	.026	-.006	.019	.044	.080	-.029	-.019	-.020	-.035	-.037	-.030	-.041	1.60
.047	.029	-.002	.021	.048	.081	-.027	-.015	-.016	-.042	-.040	-.034	-.046	1.65
.050	.031	-.003	.021	.050	.086	-.026	-.017	-.023	-.043	-.043	-.031	-.049	1.70
.055	.031	-.002	.025	.057	.097	-.029	-.022	-.035	-.050	-.040	-.036	-.047	1.75
.037	.021	-.000	.018	.040	.071	-.021	-.026	-.026	-.034	-.025	-.026	-.029	1.80
.038	.025	.002	.021	.039	.071	-.020	-.026	-.028	-.037	-.032	-.021	-.028	1.85
.017	.015	.006	.018	.026	.037	-.015	-.016	-.017	-.023	-.017	-.010	-.017	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	[illegible]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

7 CASES

Set 2, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 237-240

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
-.305	-.095	.542	-.047	-.213	-.213	-.034	-.135	-.145	-.079	-.016	.644	.104	.05
-.570	-.183	1.019	-.090	-.395	-.395	-.065	-.253	-.273	-.148	-.034	1.206	.197	.10
-.549	-.194	1.013	-.103	-.384	-.376	-.082	-.252	-.275	-.162	-.063	1.227	.200	.15
-.496	-.194	.946	-.114	-.353	-.336	-.098	-.237	-.260	-.166	-.095	1.210	.187	.20
-.444	-.194	.873	-.113	-.319	-.293	-.114	-.216	-.241	-.165	-.119	1.164	.177	.25
-.405	-.191	.810	-.112	-.284	-.247	-.130	-.196	-.228	-.170	-.138	1.134	.163	.30
-.406	-.185	.793	-.107	-.260	-.214	-.154	-.194	-.235	-.187	-.132	1.141	.140	.35
-.399	-.172	.775	-.109	-.237	-.181	-.178	-.191	-.245	-.208	-.119	1.151	.108	.40
-.385	-.145	.767	-.120	-.221	-.158	-.201	-.194	-.257	-.226	-.097	1.160	.066	.45
-.357	-.086	.782	-.138	-.210	-.140	-.219	-.201	-.271	-.245	-.110	1.166	.025	.50
-.335	-.040	.796	-.147	-.197	-.125	-.235	-.209	-.271	-.253	-.142	1.162	-.006	.55
-.315	-.070	.812	-.138	-.166	-.103	-.240	-.202	-.270	-.254	-.157	1.138	-.033	.60
-.300	-.109	.823	-.135	-.143	-.086	-.234	-.194	-.274	-.261	-.157	1.117	-.049	.65
-.285	-.121	.818	-.156	-.151	-.092	-.224	-.200	-.266	-.263	-.150	1.085	.001	.70
-.266	-.121	.803	-.176	-.163	-.110	-.196	-.194	-.259	-.259	-.125	1.060	.002	.75
-.245	-.131	.794	-.181	-.184	-.131	-.169	-.171	-.233	-.249	-.090	1.044	-.039	.80
-.227	-.092	.765	-.186	-.156	-.063	-.179	-.183	-.233	-.253	-.110	1.017	-.093	.85
-.218	-.102	.754	-.172	-.126	-.049	-.200	-.158	-.222	-.218	-.112	.987	-.167	.90
-.188	-.122	.717	-.167	-.110	-.064	-.180	-.156	-.216	-.219	-.088	.934	-.147	.95
-.070	-.024	.342	-.100	-.061	-.038	-.148	-.115	-.162	-.172	-.060	.633	-.023	1.00
.023	-.021	-.009	-.066	.013	.052	-.066	-.033	-.067	-.067	-.045	.300	-.006	1.05
.061	-.011	-.041	-.030	.053	.094	-.059	-.017	-.046	-.057	-.061	.181	-.063	1.10
.076	-.003	-.058	-.019	.067	.100	-.056	-.022	-.051	-.056	-.055	.172	-.088	1.15
.084	.001	-.063	-.007	.082	.110	-.061	-.016	-.056	-.071	-.075	.167	-.091	1.20
.084	-.001	-.067	-.006	.082	.114	-.051	-.013	-.049	-.064	-.066	.139	-.097	1.25
.088	-.003	-.074	-.010	.074	.108	-.048	-.007	-.048	-.061	-.067	.152	-.097	1.30
.083	-.008	-.082	-.018	.070	.101	-.044	-.002	-.032	-.057	-.072	.148	-.086	1.35
.090	-.001	-.073	-.013	.082	.109	-.057	-.014	-.045	-.057	-.070	.139	-.088	1.40
.091	.003	-.067	-.009	.080	.110	-.061	-.021	-.052	-.064	-.063	.149	-.088	1.45
.091	-.004	-.080	-.014	.077	.111	-.049	-.022	-.046	-.069	-.067	.156	-.084	1.50
.098	-.001	-.071	-.004	.074	.111	-.061	-.011	-.060	-.072	-.072	.154	-.080	1.55
.093	.001	-.064	.001	.079	.106	-.053	.001	-.070	-.083	-.082	.163	-.087	1.60
.074	-.001	-.052	.005	.071	.081	-.025	.005	-.019	-.032	-.041	-.013	-.048	1.65
.080	-.003	-.057	.001	.067	.083	-.028	.003	-.021	-.034	-.034	-.015	-.040	1.70
.070	.004	-.081	.002	.050	.063	-.014	.017	-.008	-.021	-.033	-.010	-.039	1.75
.069	.005	-.083	.003	.052	.063	-.017	.015	-.006	-.023	-.036	.001	-.042	1.80
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

4 CASES

Set 3, Table E — Deviations of Mean Local Pressurant Fractions, Scaling Runs 241-244

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.757	.485	-.065	.214	.508	.793	-.356	-.251	-.499	-.404	-.293	-.455	-.360	.05
-1.867	-1.799	-1.735	-1.486	-2.009	-2.329	1.705	1.763	1.445	1.508	1.088	2.049	1.669	.10
-2.544	-2.339	-2.008	-1.846	-2.591	-3.092	2.195	2.183	1.902	1.989	1.401	2.622	2.124	.15
-1.487	-1.349	-1.251	-1.252	-1.472	-1.540	1.671	1.161	.780	1.332	.747	1.495	1.159	.20
-1.035	-.925	-.873	-.891	-1.002	-1.045	1.227	.816	.513	.887	.494	1.074	.760	.25
-.263	-.243	-.234	-.252	-.275	-.331	.332	.241	.147	.174	.125	.402	.187	.30
-.110	-.153	-.147	-.147	-.186	-.211	.094	.113	.146	.130	.090	.273	.107	.35
-.024	-.060	-.060	-.055	-.084	-.121	.024	.027	.045	.035	-.002	.184	.100	.40
.018	-.004	-.016	-.018	-.025	-.052	-.024	-.011	-.011	.013	-.042	.107	.062	.45
.045	.016	-.006	-.033	-.029	-.027	-.065	-.016	-.004	-.006	-.027	.104	.040	.50
.022	.019	-.003	-.008	.004	.006	-.098	-.045	-.012	-.017	-.029	.115	.044	.55
.025	.021	.008	.017	.019	.036	-.138	-.074	-.001	-.027	-.032	.098	.042	.60
.045	.022	.013	.032	.055	.078	-.201	-.081	-.021	-.021	-.042	.090	.037	.65
.063	.065	.051	.062	.057	.011	-.177	-.120	-.027	-.025	-.034	.055	.016	.70
.081	.055	.043	.018	.015	.011	-.182	-.141	-.012	.013	-.028	.099	.032	.75
.076	.064	.045	.023	.044	.021	-.212	-.153	-.008	-.027	-.029	.110	.045	.80
.056	.060	.053	.068	.076	.065	-.230	-.144	-.039	-.031	-.045	.076	.038	.85
.073	.055	.034	.028	.007	-.006	-.223	-.107	.004	-.003	.007	.083	.047	.90
.051	.042	.026	.030	.032	.046	-.203	-.151	.003	-.009	-.011	.099	.055	.95
.095	.077	.051	.069	.077	.078	-.171	-.166	-.018	-.042	-.054	.015	-.016	1.00
.071	.054	.033	.023	.030	.041	-.154	-.109	-.002	-.014	-.017	.044	-.003	1.05
.028	.017	.014	.017	.030	.032	-.129	-.104	.013	.001	-.006	.059	.019	1.10
.024	.015	.014	.027	.030	.048	-.118	-.101	-.001	.004	.003	.053	-.003	1.15
.030	.019	.008	.021	.027	.057	-.088	-.089	-.004	-.010	-.014	.054	-.016	1.20
.033	.028	.019	.032	.022	.033	-.090	-.065	-.027	-.039	-.013	.060	.001	1.25
.036	.029	.023	.039	.025	.029	-.092	-.063	-.033	-.027	-.023	.079	-.029	1.30
.040	.028	.020	.023	.013	.025	-.083	-.026	-.029	-.021	-.029	.071	-.032	1.35
.034	.026	.011	.028	.028	.034	-.076	-.057	-.038	-.024	-.016	.074	-.030	1.40
.034	.029	.024	.038	.035	.048	-.084	-.073	-.038	-.034	-.015	.057	-.028	1.45
.035	.029	.021	.033	.028	.047	-.069	-.033	-.057	-.034	-.011	.032	-.027	1.50
.014	.004	-.003	.018	.021	.027	-.032	-.022	-.048	-.043	.003	.074	-.020	1.55
.004	.015	.002	.022	.004	.018	-.041	-.027	-.052	-.014	-.002	.093	-.028	1.60
.010	.011	-.003	.016	.003	.016	-.030	-.014	-.028	-.028	-.028	.098	-.028	1.65
.004	.003	.003	.016	.008	.012	-.014	-.003	-.028	-.024	-.016	.080	-.044	1.70
.007	.006	-.007	.017	.005	.017	-.022	-.010	-.008	-.008	-.008	.058	-.049	1.75
-.002	.003	.004	.006	-.001	.001	.000	.000	.000	-.008	-.012	.006	-.001	1.80
-.003	.002	0.000	.005	-.007	-.003	-.007	-.007	-.007	.005	-.001	.030	-.007	1.85
-.004	-.002	.002	.007	-.004	-.003	-.009	-.009	-.009	.003	.003	.034	-.009	1.90
-.003	-.003	-.001	.002	.001	.003	-.002	-.002	-.002	-.002	-.002	.010	-.002	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

4 CASES

Set 4, Table E — Deviations of Mean Local Pressurant Fractions, Scaling Runs 245-248

LOCATIONS I

1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.690	.512	.305	.304	.483	.608	-.598	-.349	-.389	-.413	-.331	-.436	-.379	.05
.687	.596	.615	.343	.544	.592	-.697	-.562	-.498	-.530	-.134	-.509	-.450	.10
-.526	-.567	-.950	-.968	-1.398	-1.249	1.934	1.178	.528	.043	.349	1.245	.389	.15
-2.755	-2.887	-4.638	-3.938	-5.712	-5.172	7.674	5.191	2.813	1.185	1.122	5.136	1.981	.20
-1.370	-1.442	-2.275	-1.959	-2.781	-2.558	3.704	2.591	1.382	.573	.570	2.546	1.020	.25
-.464	-.430	-.459	-.392	-.470	-.496	.665	.528	.250	.145	.176	.539	.407	.30
-.256	-.209	-.292	-.221	-.253	-.235	.350	.325	.123	.041	.034	.385	.205	.35
-.108	-.116	-.096	-.116	-.182	-.137	.195	.207	.048	.007	-.056	.231	.118	.40
-.017	-.028	-.069	-.077	-.137	-.092	.123	.128	-.005	-.017	-.048	.120	.113	.45
.020	-.009	-.068	-.061	-.068	-.037	.039	.057	.007	-.019	-.044	.125	.053	.50
.061	.032	0.000	-.004	-.019	-.007	-.087	-.048	-.063	-.055	-.023	.138	.070	.55
.055	.036	.025	.023	.017	.007	-.197	-.098	-.055	-.053	-.031	.155	.115	.60
.075	.078	.043	.051	.019	.023	-.201	-.098	-.032	-.047	-.051	.097	.039	.65
.061	.062	.059	.061	.065	.086	-.257	-.171	-.060	-.061	-.018	.112	.066	.70
.121	.098	.058	.053	.068	.061	-.299	-.181	-.078	-.043	-.029	.095	.067	.75
.123	.104	.087	.078	.071	.066	-.291	-.224	-.062	-.041	-.044	.074	.055	.80
.102	.071	.065	.095	.118	.132	-.326	-.215	-.071	-.043	-.004	.046	.026	.85
.145	.123	.081	.100	.122	.138	-.336	-.242	-.086	-.070	-.022	.061	-.003	.90
.123	.125	.116	.113	.127	.131	-.272	-.230	-.084	-.065	-.098	-.009	.017	.95
.136	.120	.085	.092	.090	.130	-.269	-.226	-.115	-.085	-.053	.044	.051	1.00
.080	.072	.058	.062	.067	.065	-.166	-.152	-.054	-.050	-.016	.034	-.002	1.05
.058	.046	.029	.032	.040	.044	-.107	-.123	-.026	-.020	-.022	.037	.009	1.10
.046	.033	.027	.017	.028	.049	-.096	-.096	-.014	-.027	-.021	.055	-.003	1.15
.052	.041	.038	.050	.045	.065	-.100	-.093	-.035	-.061	-.037	.065	-.026	1.20
.042	.050	.038	.065	.057	.071	-.107	-.099	-.050	-.066	-.043	.056	-.016	1.25
.039	.033	.031	.057	.043	.076	-.112	-.104	-.044	-.047	-.017	.055	-.013	1.30
.017	.018	.019	.039	.043	.048	-.095	-.071	-.038	-.038	-.023	.098	-.019	1.35
.030	.020	.002	.020	.019	.023	-.055	-.056	-.046	-.034	-.012	.087	.001	1.40
.028	.028	.012	.021	.007	.031	-.063	-.033	-.041	-.051	-.018	.096	-.017	1.45
.028	.014	.009	.026	.017	.031	-.033	-.033	-.052	-.048	-.015	.069	-.016	1.50
.023	.015	.002	.022	.028	.037	-.027	-.041	-.056	-.033	-.025	.083	-.027	1.55
.006	-.003	-.012	.013	.023	.052	-.039	-.027	-.035	-.025	-.026	.082	-.011	1.60
-.004	-.013	-.023	.002	.022	.052	-.039	-.027	-.026	-.026	-.026	.095	.012	1.65
-.013	-.014	-.037	-.008	.009	.042	-.029	-.029	-.028	-.010	-.017	.088	.043	1.70
-.007	-.011	-.016	-.002	0.000	.014	-.011	-.003	-.011	.011	-.018	.024	.024	1.75
-.006	-.008	-.012	-.001	-.001	.010	-.010	.012	-.009	.012	-.010	.012	.012	1.80
-.008	-.004	-.006	.007	-.002	.003	-.008	.014	.014	-.007	-.008	.014	-.007	1.85
-.006	-.004	-.002	.012	-.004	.002	.009	.009	.009	-.014	-.014	.009	-.008	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

4 CASES

DISCUSSION

For convenience of discussion, we have plotted in Figs. 6 through 9 typical data from the four sets of experiments described in Table 1. Mean local pressurant fractions for selected I locations, $\overline{X}_I$ are plotted vs dimensionless times τ. From scale-modeling considerations [2], values of τ are defined for the pressurization period as follows:

$$\tau = \overline{X}/\overline{X}_c \qquad (t < t_c)$$

and

$$\tau - 1 = (t - t_c)/\theta_c \qquad (t > t_c),$$

where t_c is the time of valve closure, $\overline{X} = \overline{X}_c$ when $t = t_c$, and

$$\theta_c = -[\ln(1 - \overline{X})/dt]^{-1}_{t \to t_c}.$$

Typical error bars are given in Figs. 6 to 9 for I location number 8; they show ± 1 standard deviation. In general, these data are statistically meaningless for low values of τ, below 0.5 or 0.6. We attribute this condition at the beginning of each experimental run to the time required for control valves to open (about 2 s) and for flows to become quasi-steady. The analysis that infers local pressurant history from measured local temperature history, called the thermal method [2], assumes quasi-steady flow conditions. Response times for the bare-wire thermocouples, 0.1 mm in diameter, are conservatively 0.2 s or less; bead diameters are 2 to 2.5 times the wire diameter. Thus, these results represent engineering approximations, average values that show no turbulent structure. Even so, the data imply that the gases mix rapidly and that no pockets with large excesses of oxygen or nitrogen gas exist for any appreciable time period.

In Fig. 6, we show typical local mean pressurant mole fractions at three I-locations for experimental set 1, which had seven replicate runs. The solid line represents perfect mixing; at $\tau = 1.0$, $t = t_c$. With pressurant delivered from three 32.79-mm nozzles at Mach-1 velocities, mixing is almost instantaneous when there are no flow obstacles. These I-locations are off center, 0.6 of the distance to the

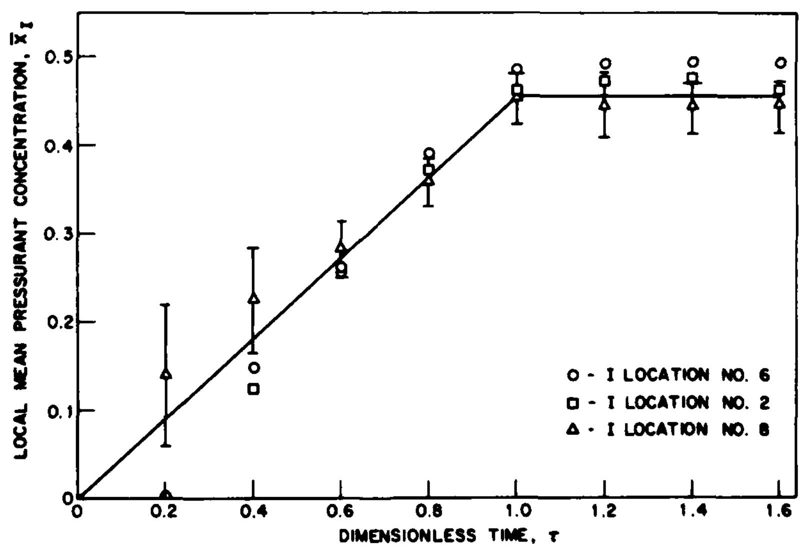

Fig. 6 — Local mean pressurant concentration (mole fraction) vs dimensionless time for three I locations of experimental set 1, off-center thermocouple-array position 1 with three nozzles and no flow obstacle

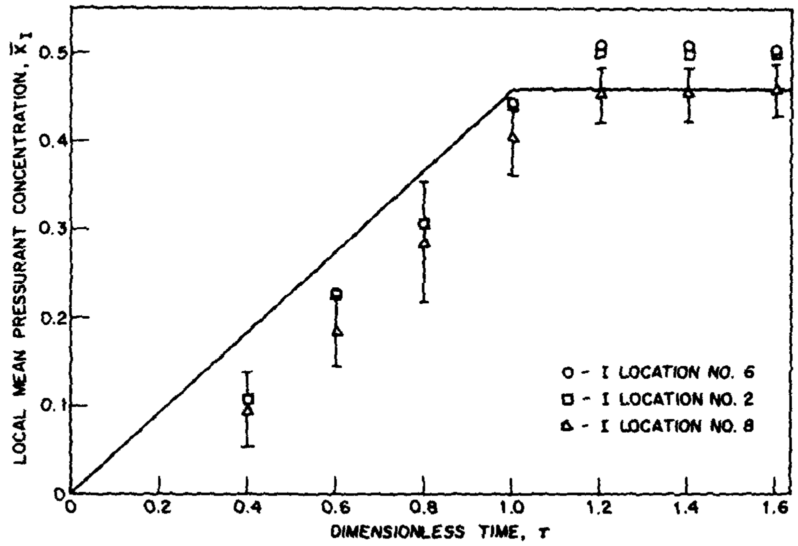

Fig. 7 — Local mean pressurant concentration (mole fraction) vs dimensionless time for three *I* locations of experimental set 2, chamber-centerline thermocouple-array position 2, with three nozzles and no flow obstacle

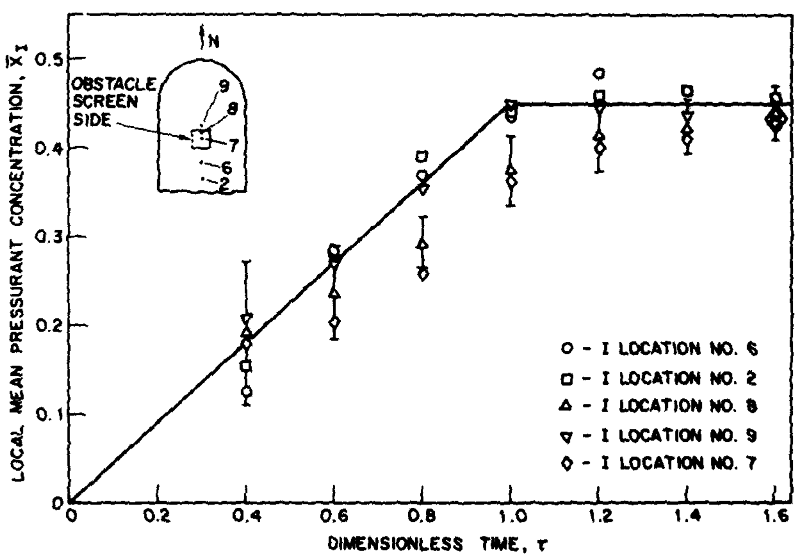

Fig. 8 — Local mean pressurant concentration (mole fraction) vs dimensionless time for five *I* locations of experimental set 3, centerline thermocouple-array position 2, with the south nozzle and flow obstacle, screen side facing west.

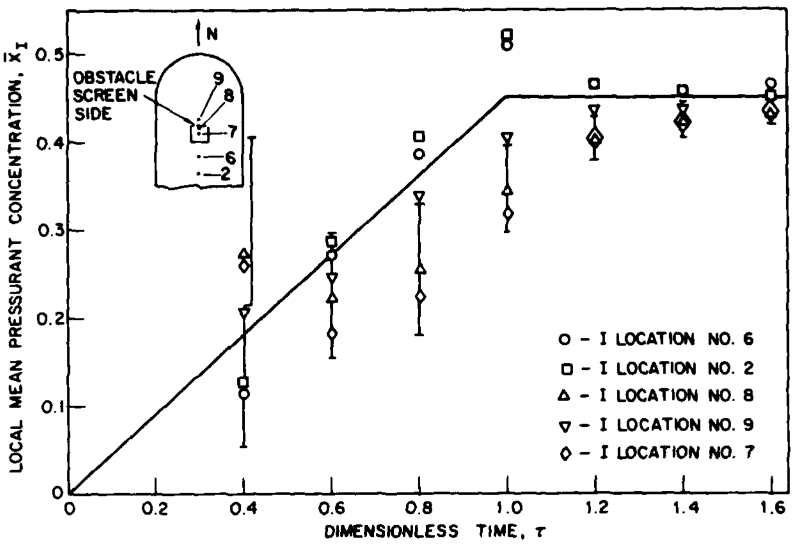

Fig. 9 — Local mean pressurant concentration (mole fraction) vs dimensionless time for five *I* locations of experimental set 4, centerline thermocouple-array position 2, with the south nozzle and flow obstacle, screen side facing north.

chamber wall. Figure 7 shows the same experimental conditions, but the *I*-locations are along the chamber centerline. Notice that mixing is less rapid here, and 1.2 injection times pass before complete mixing is indicated. These data represent set 2, which had four replicate runs. Although pressurant deficiences were small, they were statistically significant. These centerline *I*-locations were not beneath any of the three nozzles, where pressurant concentrations are high.

Experimental sets 3 and 4 were performed with a flow obstacle; Figs. 8 and 9, respectively, show typical data for them. The obstacle was a cabinetlike enclosure with top, bottom, and three sides closed; the fourth side was covered with a screen wire. As the sketches in Figs. 8 and 9 show, *I*-locations 7 and 8 are inside the obstacle and *I*-location 9 is directly behind the obstacle (see Fig. 5), relative to the south-nozzle location. Pressurant was injected only from the south nozzle in sets 3 and 4, thus giving the most severe conditions for mixing; injection times were about 30 s. With the obstacle screen side facing west, Fig. 8 shows that pressurant is mixed inside and behind the obstacle within about 1.4 injection times. With the screen side facing north, Fig. 9 shows that these conditions are met in about 1.6 injection times.

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2. R.C. Corlett, J.P. Stone, and F.W. Williams, "Scale Modeling of Inert Pressurant Distribution," Fire Technology **16**, 259-272 (Nov. 1980).

3. H.S. Bean, ed., *Fluid Meters: Their Theory and Application*, 6th ed., American Society of Mechanical Engineers, New York, 1971.

4. A.S. Shapiro, "*The Dynamics and Thermodynamics of Compressible Fluid Flow*," Ronald Press, New York, 1953, Vol. 1, pp. 83-93.

5. J.P. Stone, R.C. Corlett, J.I. Alexander, and F.W. Williams, "NRL 5-m³ Chamber Pressurization Experiment: Pressurant Concentration Histories," NRL Report 8503, Sept. 8, 1981.

6. R.C. Corlett, University of Washington, original computer programs written under Contract N00014-75-C-1085 (1979).

APPENDIX A

Programs BIGST and PRODF accept raw data tapes and produce the A-tables [6].

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&BIGST T=00004 IS ON CR00069 USING 00075 BLKS R=0000

FTN4
C-----------------------------------------------------C
      PROGRAM BIGST
C                                                     C
C     VERSION 800721--4   BY STEVE LUSTIG             C
C                                                     C
C-----FUNCTIONS:--------------------------------------C
C  1) TO MAKE ASCII DISC FILES FROM EBCIDIC DATA      C
C     LOGGER TAPES                                    C
C  2) TO MAKE ASCII DISC FILES FROM ASCII OR          C
C     EBCIDIC MASTER TAPE                             C
C  3) TO BUILD ASCII MASTER TAPE FROM EBCIDIC         C
C     DATA LOGGER TAPES                               C
C  4) TO BUILD A 'PRODA INPUT TAPE' FROM DISC FILES   C
C  5) TO PRINT DISC FILES ON LINEPRINTER/TERMINAL     C
C                                                     C
C-----MISCELLANEOUS:----------------------------------C
C  1) THIS PROGRAM & ITS SUBROUTINES CALL:            C
C                                                     C
C  2) DATA LOGGERS WHICH THIS PROGRAM ACCOMODATES:    C
C     DORIC #220 (FIXED,EBCIDIC)                      C
C     DORIC #220 (MOBILE,EBCIDIC)                     C
C     DORIC #240 (MOBILE,EBCIDIC)                     C
C  3) THIS PROGRAM ASSUMES:                           C
C     -MAXIMUM 20 CHANNELS/SCAN                       C
C      ( 0< CHANNEL #'S < 100 )                       C
C     -TAPE DRIVES LU8 & LU18 ARE AVAILABLE           C
C      ON REQUEST                                     C
C     -MASTER TAPE CHARACTER SET IS ASCII             C
C  4) NO FUNCTION IN THIS PROGRAM IS DEPENDENT        C
C     ON THE USER'S RUNNING ANY PREVIOUS FUNCTION     C
C     DURING THE SAME SCHEDULING OF THIS PROGRAM      C
C-----------------------------------------------------C
      COMMON  LU(5),NAME(3,20),NAMCNT,ICR(20),IPAST(3),IBUFR(272),
     +IDCB(272),ISCR(214)
      INTEGER BAD,IBLANK(384),ANS
      DATA IBLANK/384*2H  /
C
C       -----------DETERMINE LU# OF THE DEVICE------------------------
        CALL RMPAR(LU)
C       -----------ARRAY PAST ACCOUNTS VISITED TASKS------------------
        DO 1 I=1,3
   1    IPAST(I)=0
        NAMCNT = 0
C       -----------DETERMINE TASK-------------------------------------
   2    WRITE(LU,5)
   5    FORMAT(1X,'ENTER:    0    TO CREATE ASCII DISC FILE'
     +/17X,'FROM ONE DATA LOGGER TAPE'
     +/17X,'OR MASTER TAPE'
     +/11X,'1     TO CREATE ASCII DISC FILES FROM'
     +/17X,'FROM 2 DATA LOGGER TAPES'
     +/11X,'2     TO CREATE A MASTER TAPE FROM DISC FILES'
     +/11X,'3     TO LIST DATA ON A PRODA INPUT TAPE'
     +/17X,'OR ON A TERMINAL/LINEPRINTER'
     +/11X,'4     TO END PROGRAM')
        READ(LU,*)MODE
        GO TO (100,100,200,300,400),MODE+1
C
```

```
C
  100   IPAST(1)=1
C       -------------------------------------------------------C
C       FUNCTION: TO TRANSFER A FILE (EG. DATA) OF ANY RECORD    C
C                 LENGTH FROM MT TO ONE OF THE PLATTERS          C
C         FORMAT: USER IS REQUIRED TO INPUT RECORD LENGTH        C
C                 THIS FUNCTION  USES ONLY AS MUCH SPACE AS FILE C
C                 REQUIRES, RETURNING THE REST BACK TO FMGR.     C
C        !!MAXIMUM OF 20 CHANNELS/SCAN!!(SOUNDS REASONABLE)      C
C--------------------------------------------------------------C
    7   ITAPE=MODE+1
C
C
        IF(ITAPE.EQ.1)WRITE(LU,15)
        IF(ITAPE.EQ.2)WRITE(LU,16)
   15   FORMAT('MOUNT TAPE ON LU 8 ..... ENTER "1" WHEN READY')
   16   FORMAT('MOUNT TAPE WITH 1ST  CHANNELS ON LU 8',
     1/'MOUNT TAPE WITH 2ND  CHANNELS ON LU 10',
     2/'ENTER "1" WHEN READY')
        READ(LU,*)IANS
C
C------CHARACTERS/RECORD FOR BUFFER
C
        WRITE(LU,35)
  35    FORMAT('ENTER # OF CHANNELS PER SCAN')
        READ(LU,*)NOCHAN
        NCHAR=(NOCHAN*11+23)
        NWORDS=(NCHAR+1)/2
        IDCBS=256
        NINTEG=NOCHAN*8+6
C
C------SKIP FILES
C
        WRITE(LU,17)
  17    FORMAT('ENTER # OF TAPE FILES TO SKIP')
        READ(LU,*)NSKIP
        IF(NSKIP.GT.0)CALL SKIP(IANS,ITAPE,NWORDS)
C
C------FILE NAME
C
        WRITE(LU,20)
  20    FORMAT('ENTER A DISC FILE NAME - 6 ASCII CHARS')
        NAMCNT = NAMCNT + 1
        READ(LU,30)(NAME(II,NAMCNT),II=1,3)
  30    FORMAT(3A2)
        WRITE(LU,40)
 40     FORMAT('ENTER PREFERRED CARTRIDGE (0 IF NO PREFERENCE)')
        READ(LU,*)(ICR(NAMCNT))
C
C       DEFINE FILE PARAMETERS FOR EXCLUSIVE OPEN, STANDARD
C       SEQUENTIAL ACCESS,WITH FILE TYPE DEFINED AT CREATION
C       (OR DEFAULT TO TYPE 3)
C
        ISIZE=-1
        IOPTN=0
        ITYPE = 3
        ISECU = 0
C
C------CALL CREAT: CREATE DISC FILE USING INFO SUPPLIED BY USER
C
```

```
         CALL CREAT(IDCB,IERR,NAME(1,NAMCNT),ISIZE,
     +  ITYPE,ISECU,ICR(NAMCNT),IDCBS)
         WRITE(LU,21)IERR
  21     FORMAT(/'**CREAT MESSAGE IER=',I6)
         IF(IERR.LT.0)CALL ERR(IERR)
C
C-------CALL OPEN: EXCLUSIVE OPEN, WITH STANDARDSEQUENTIAL ACESS
C        SEARCH ALL CARTRIDGES FOR FILE, RETURNING SUCCESS OF OPEN
C        IN IER
C
         CALL OPEN(IDCB,IERR,NAME(1,NAMCNT),IOPTN,ISECU,ICR(NAMCNT),
     +  IDCBS)
         WRITE(LU,22)IERR
   22    FORMAT(/'**OPEN MESSAGE IER=',I3)
         IF(IERR.LT.0)CALL ERR(IERR)
C
C-------THIS LOOP WILL READ IN DATA FROM TAPE,
C        TRANSFER IT TO THE DISC, AND TEST RECORD
C
         IRNO = 0
         ITPNO = 8
C
C-----TYPE TAPE CHARACTER SET
C
       ICNVRT=0
       IF (ITAPE.NE.1) GOTO 31
  28   WRITE(LU,29)
  29   FORMAT(' FOR SINGLE TAPE CHARACTER SET:'
     +/2X,"ENTER '0' FOR EBCIDIC "
     +/8X,"'1' FOR ASCII")
       READ(LU,*)ICNVRT
       IF((ICNVRT.NE.0).AND.(ICNVRT.NE.1))GOTO28
  31   WRITE(LU,86)
  86   FORMAT('**WAIT FOR TAPE READ')
C
C
         DO  97 LOOP=1,ITAPE
              IF(LOOP.EQ.2)ITPNO=18
C
C----------------GET A RECORD OF SIZE IDCBS
C
  44                CALL EXEC(1,ITPNO,IBUFR,NWORDS)
C
C----------------CHECK IF END OF TAPE FILE
C
                    CALL EXEC(13,ITPNO,ISTAT)
                    ISTAT = IAND(ISTAT,40200B)
                    IF(ISTAT.NE.200B)GO TO 47
                    IF(ITAPE.EQ.1.OR.LOOP.EQ.2)GO TO 97
                    CALL WRITF(IDCB,IERR,IBLANK,NWORDS)
                    GO TO 97
C
C----------------CONVERT SCAN TO ASCII
C
  47                IF(ICNVRT.NE.0) GOTO 32
              CALL EBCAS(IBUFR,NWORDS)
C----------------CHECK IF RECORD IS A GOOD ONE
C
  32                CALL CODE(NCHAR)
                    READ(IBUFR,41)(ISCR(J),J=1,NINTEG)
```

```
                      CONTINUE
 41                   FORMAT(13X,3(2I1,1X),20(2X,2I1,1X,6I1),1X)
                      DO 14 K=1,NINTEG
                      BAD=1
                      DO 95 J=0,9
                      IF(ISCR(K).EQ.J)BAD=0
 95                   CONTINUE
C                     IF BAD=1, THROW AWAY SCAN
                      IF(BAD.NE.1) GO TO 14
                      WRITE(LU,50)(IBUFR(IJ),IJ=1,NWORDS)
 50                   FORMAT('**BAD INPUT*LINE BEING DISCARDED',('  ',249A2))
                      GO TO 44
 14                   CONTINUE
C
C
C----------------WRITE RECORD TO DISC FILE
C
 60                   CALL WRITF(IDCB,IERR,IBUFR,NWORDS)
                      IF(IERR .LT. 0) CALL ERR(IERR)
                      IRNO = IRNO + 1
                      GO TO 44
 97                   CONTINUE
C
C
C------CALL LOCF: EXECUTION OF THE NEXT STATEMENTS RELEASES THE UNUSED
C       PORTION OF THE CR HELD BY THIS ROUTINE
C
        CALL LOCF(IDCB,IERR,IREC,IRB,IOFF,JSEC)
        WRITE(LU,98)IERR
 98     FORMAT('**LOCF MESSAGE IER= ',I6)
        IF(IERR.LT.0)CALL ERR(IERR)
        ITRUN=JSEC/2-IRB-1
C
C------CALL CLOSE: TRUNCATING THE UNUSED PORTION OF THE CR.
C
        CALL CLOSE(IDCB,IERR,ITRUN)
        WRITE(LU,66)IERR
  66    FORMAT('**CLOSE MESSAGE IER=',I6)
        IF(IERR.LT.0)CALL ERR(IERR)
C
        WRITE(LU,65)IRNO,(NAME(N,NAMCNT),N=1,3)
65      FORMAT('**',I6,' RECORDS WRITTEN TO FILE ',3A2)
C
        WRITE(LU,70)
   70   FORMAT(' TRANSFER ANOTHER FILE ? (Y\N)')
        READ(LU,201)IANS
        IF(IANS.EQ.1HY)GO TO 7
C
        GOTO2
 200  IPAST(2)=1
C-------------------------------------------------------C
C                     OLD MASTR                         C
C     THIS SECTION ALLOWS THE USER TO SAVE DISC         C
C     FILES ONTO A MASTER TAPE.  THIS MASTER TAPE       C
C     CAN LATER BE USED AS INPUT TO THIS PROGRAM.       C
C     DISC FILES NEED NOT HAVE BEEN CREATED DURING      C
C     THIS SCHEDULE OF BIGST. MASTER TAPE ASSUMED ASCII C
C-------------------------------------------------------C
      IF(IPAST(1).EQ.0) GOTO 23
C
```

```
C
      WRITE(LU,3)
 3    FORMAT('TO TRANSFER DISC FILES MOUNT MASTER TAPE ON LU8'
     + /1X,'AND ENTER AN INTEGER WHEN READY')
      READ(LU,*)IANS
C
C
      DO 101 I=1,NAMCNT
C
C----------PROMPT WITH NAMES OF FILES CREATED SO FAR
C
            WRITE(LU,11)(NAME(II,I),II=1,3)
 11         FORMAT('TRANSFER FILE ',3A2,' ?  (Y\N)')
            READ(LU,201) ANS
            IF(ANS.EQ.1HN) GOTO 101
C
C----------TRANSFER THE I'TH FILE ON THE LIST
C
            CALL TRANS(I)
C
101   CONTINUE
C
C
      WRITE(LU,27)
 27   FORMAT('XFER A PREVIOUS FILE? (Y/N)')
      READ(LU,201)ANS
 201  FORMAT(A1)
      IF (ANS.NE.1HY) GOTO2
C
C-----TRANSFER FILES CREATED PREVIOUSLY OUTSIDE THIS SCHEDULE
C     FILES ARE ASSUMED ALL READY EDITED & CONVERTED
C
 23   WRITE(LU,13)
 13   FORMAT(1X,'MASTER TAPE SHOULD BE ON LU 8')
      NAMCNT=NAMCNT+1
      WRITE(LU,24)
 24   FORMAT('ENTER FILE NAME--6 ASCII CHARACTERS')
      READ(LU,30)(NAME(II,NAMCNT),II=1,3)
      WRITE(LU,25)
 25   FORMAT('ENTER CARTRIDGE #')
      READ(LU,*)(ICR(NAMCNT))
      WRITE(LU,26)
      CALL TRANS(NAMCNT)
 26   FORMAT('TRANSFER ANOTHER FILE? (Y/N)')
      READ(LU,201)ANS
      IF(ANS.NE.1HN) GOTO 23
C
C
      GO TO 2
 300  IPAST(3)=1
C-----------------------------------------------------------C
C     THIS SECTION ALLOWS THE USER TO MAKE A                C
C     PRODA INPUT TAPE FROM DISC FILES CREATED              C
C     DURING PAST AND CURRENT RUNS OF THE PROGRAM.          C
C     THE USER MAY USE EITHER TAPE DRIVES FOR OUTPUT.       C
C     THE USER MAY ALSO SIMPLY PRINT THE OUTPUT ON          C
C     ANY TERMINAL OR PRINTER                               C
C-----------------------------------------------------------C
      WRITE(LU,4)
 4    FORMAT(' TO CREATE PRODA INPUT TAPE FROM DISC FILES:'
```

```
      + /5X,'MOUNT PRODA TAPE ON A TAPE DRIVE &'
      + /5X,'ENTER THE LU# OF THE TAPE WHEN READY.'
      + /1X,'TO LIST THE OUTPUT ELSEWHERE:'
      + /5X,'ENTER THE LU NUMBER WHEN READY.')
       READ(LU,*)IOUTDV
C
       IF((IPAST(1).EQ.0).AND.(IPAST(2).EQ.0)) GOTO 19
 39    DO 103 I=1,NAMCNT
C
C---------PROMPT WITH NAMES OF FILES CREATED SO FAR
C
             WRITE(LU,6)(NAME(II,I),II=1,3)
 6           FORMAT('TRANSFER FILE ',3A2,' ? (Y\N)')
             READ(LU,201) ANS
             IF(ANS.EQ.1HN) GO TO 103
C
C---------WRITE OUT THE I'TH FILE ON THE LIST
C
             CALL OUTPR(I,IOUTDV)
C
C---------OPEN & THEN PURGE THIS DISC FILE
C
             CALL OPEN(IDCB,IERR,NAME(1,I),0,0,ICR(I))
             IF(IERR.LT.0)CALL ERR(IERR)
D            CALL PURGE(IDCB,IERR,NAME(1,I),0,ICR(I))
D            IF(IERR.LT.0) CALL ERR(IERR)
C
 103   CONTINUE
C
C-----TRANSFER FILES WHICH WERE NOT CREATED DURING THIS
C            SCHEDULE
C
 19    NAMCNT=0
       WRITE(LU,34)
 34    FORMAT('TRANSFER PREVIOUSLY CREATED FILE? (Y\N)')
       READ(LU,201) ANS
       IF(ANS.EQ.1HN) GOTO 36
       NAMCNT=NAMCNT+1
       WRITE(LU,37)
 37    FORMAT('ENTER FILE NAME--6 ASCII CHARACTERS')
       READ(LU,30) (NAME(II,NAMCNT),II=1,3)
       WRITE(LU,38)
 38    FORMAT('ENTER CARTRIDGE #')
       READ(LU,*)(ICR(NAMCNT))
       GOTO 39
C
C
 36    IF ((IOUTDV.NE.8).AND.(IOUTDV.NE.18)) GOTO 2
C
C-----WRITE OUT 'END OF TAPE' MARK (WILL BE USED BY PRODA).
C
       WRITE(IOUTDV,75)
       ENDFILE IOUTDV
C      CALL EXEC(3,10,IOUTDV)
 75    FORMAT('XXXX')
C
       GOTO 2
C
C
C---------------------------------------------------------C
```

```
C              END PROGRAM                                         C
C------------------------------------------------------------------C
 400  WRITE(LU,401)
 401  FORMAT('END OF BIGST')
      STOP
      END
C
C
C******************************************************************C
      SUBROUTINE OUTPR(NUM,IOUTDV)
C
C     THIS SUBROUTINE TRANSFERS THE NUM'TH FILE ON THE LIST
C     TO THE OUTPUT MEDIUM.
C
C
      COMMON LU(5),NAME(3,20),NAMCNT,ICR(20),IPAST(3)
      INTEGER HTIME,MTIME,STIME,ICHAR(550),ICHAN(20)
      INTEGER IDCB(272),ITITLE(40),KCHAN(20)
      INTEGER IPOW(20)
      REAL STORE(20),OUT(20)
      DATA IBLANK/384*2H  /,IDCBS/256/
C
C     INITIALIZE ARRAYS
C
      DO 2 I = 1 , 40
  2   ITITLE(I) = IBLANK
C
C     OPEN THE FILE
C
      CALL OPEN(IDCB,IERR,NAME(1,NUM),0,0,ICR(NUM),IDCBS)
      IF(IERR.LT.0) CALL ERR(IERR)
C
C     GET INFORMATION ABOUT THE LOGGERS
C
  9   WRITE(LU,10)
 10   FORMAT(' ENTER # OF CHANNELS, & CHANNEL #S (I2)')
      READ(LU,3)NCHAN,(ICHAN(I),I=1,NCHAN)
      NCHAR=NCHAN*11+23
  3   FORMAT(21(I2,1X))
      IF(NCHAN.GT.20) GO TO 9
C
        DO 4 I = 1 , 20
  4      OUT(I) = 0.0
C
 41   WRITE(LU,15)
 15   FORMAT('ENTER TITLE FOR THIS FILE (UP TO 80 CHARS)')
      READ(LU,20) (ITITLE(I), I = 1, 40)
 20   FORMAT(40A2)
C
C     WRITE OUT THE HEADER TO OUTPUT LU
C
      WRITE(IOUTDV,25) (ITITLE(I), I = 1, 40)
      WRITE(IOUTDV,30)(ICHAN(I),I=1,NCHAN)
      WRITE(IOUTDV,35)
 25   FORMAT(1X,40A2)
 30   FORMAT('0 CHANNELS ',20(7X,I2))
 35   FORMAT('0 TIME')
C
C     READ A RECORD
C
```

```
 37   CALL READF(IDCB,IERR,ICHAR,550,LEN)
           IF(IERR.LT.0)CALL ERR(IERR)
           IF(LEN.EQ.-1)GO TO 70
C
           IF(ICHAR.NE.IBLANK)GO TO 39
C
C                WRITE(IOUTDV,75)
C                WRITE(LU,38)
C38              FORMAT('SECOND GROUP OF CHANNELS WILL BE'
C    1           ,' PROCESSED NOW.'/'FOR SECOND GROUP OF'
C    2           ,' CHANNELS, PLEASE')
C                GO TO 9
C
C          CONVERT ASCII STRING TO INTEGERS AND REALS
C
 39        CONTINUE
           CALL CODE(2*LEN)
           READ(ICHAR,40)HTIME,MTIME,STIME,(KCHAN(I),STORE(I),
     1                          IPOW(I), I = 1, NCHAN)
 40        FORMAT(13X,3(I2,1X),20(2X,I2,1X,F5.5,I1),1X)
C
C          MULTIPLY BY APPROPRIATE POWER OF 10
C
           DO 50 I = 1 , NCHAN
 50        STORE(I) = STORE(I)*(10.0**(3-IPOW(I)))
C
C          WRITE DATA OUT TO RIGHT LU
C
           WRITE(IOUTDV,66)HTIME,MTIME,STIME,(STORE(JK), JK = 1, NCHAN)
 66        FORMAT(1H ,2X,I2,':',I2,':',I2,20(3X,F7.1))

C
 70   WRITE(IOUTDV,75)
 75   FORMAT(1H1,110X)
C
      CALL CLOSE(IDCB,IERR)
      IF(IERR.LT.0)CALL ERR(IERR)
C
      RETURN
      END
C************************************************************C
      SUBROUTINE SKIP(NUM,ITAPE,NWDS)
      INTEGER NUM,ITAPE,IBUFR(384)
C
      ITPNO = 8
C
      DO 100 I = 1 , ITAPE
        IF(I.EQ.2)ITPNO = 18
        DO 50 J = 1 , NUM
 25       REG = EXEC(1,ITPNO,IBUFR,NWDS)
          REG = EXEC(13,ITPNO,ISTAT)
          ISTAT = IAND(ISTAT,040200B)
          IF(ISTAT.EQ.0) GO TO 25
 50     CONTINUE
 100  CONTINUE
C
      RETURN
      END
C***********************************************************C
      SUBROUTINE ERR(IERR)
```

```
C
C     THIS SUBROUTINE PRINTS THE ERROR CODE PASSED TO IT
C
      COMMON LU(5),NAME(3,20),NAMCNT,ICR(20),IPAST(3)
      INTEGER ANS
      WRITE(LU,10)IERR
 10   FORMAT('  IERR = ',I6,'ABORT PROGRAM? (Y/N)')
      READ(LU,201) ANS
 201  FORMAT(A1)
      IF(ANS.NE.1HY) RETURN
      STOP
      END
C
C*************************************************************C
      SUBROUTINE TRANS(NUM)
C
C     THIS SUBROUTINE TRANSFERS THE N'TH FILE ON THE
C     LIST TO THE MASTER TAPE
C
      DIMENSION IDCB(272),IBUFR(272),ISCR(166)
      COMMON LU(5),NAME(3,20),NAMCNT,ICR(20),IPAST(3)
C
C     OPEN THE FILE
C
      CALL OPEN(IDCB,IERR,NAME(1,NUM),IDUM,IDUM,ICR(NUM),256)
      IF(IERR.LT.0) CALL ERR(IERR)
C
C     READ A RECORD
C
 5    CALL READF(IDCB,IERR,IBUFR,256,LEN)
            IF(IERR.LT.0)CALL ERR(IERR)
            IF(LEN.LT.0) GOTO 50
C
C           CHECK IF RECORD IS GOOD
C
            NCHAN=(LEN-23)/11
            NINTEG=NCHAN*8+6
            CALL CODE(LEN)
            READ(IBUFR,41)(ISCR(J),J=1,NINTEG)
 41         FORMAT(13X,3(2I1,1X),20(2X,2I1,1X,6I1),1X)
            DO 14 K=1,NINTEG
            IBAD=1
            DO 95 I=0,9
            IF(ISCR(K).EQ.I) IBAD=0
 95         CONTINUE
            IF (IBAD.EQ.1) GO TO 5
 14         CONTINUE
C
C           WRITE IT OUT
C
            REG=EXEC(2,8,IBUFR,LEN)
            GOTO 5
C
C     WRITE EOF ON TAPE  & AND CLOSE THE DISC FILE
C
 50   REG=EXEC(3,0110B)
      CALL CLOSE(IDCB)
      RETURN
      END
C*************************************************************C
```

```
      SUBROUTINE EBCAS(ICHAR,LEN)
C
C     THIS SUBROUTINE CONVERTS A BUFFER OF EBCIDIC
C     CHARACTERS ( CONTAINED IN AN INTEGER ARRAY),
C     FROM THE DATA LOGGER, INTO ASCII.
C
      DIMENSION ICHAR(550)
      INTEGER RCHAR,LCHAR
C
C
      DO 100 I = 1 , LEN
C
C        GET RIGHT BYTE & CONVERT IT
C
         RCHAR = IAND(ICHAR(I),077B)
            IF(RCHAR.EQ.040B)RCHAR = 055B
            IF(RCHAR.EQ.0)RCHAR = 040B
C
C        GET LEFT BYTE & CONVERT IT
C
         LCHAR = IAND(ICHAR(I),037400B)
            IF(LCHAR.EQ.020000B)LCHAR = 026400B
            IF(LCHAR.EQ.0)LCHAR = 020000B
C
C        PACK THE TWO BYTES BACK TOGETHER AGAIN
C
         ICHAR(I) = IOR(LCHAR , RCHAR)
C
  100 CONTINUE
C
C
      RETURN
C*************************************************************C
      END
```

```
&PRODF T=00003 IS ON CR00056 USING 00074 BLKS R=0000

0001  FTN4
0002  C   NOTE!! THIS IS A MODIFIED FORM OF PRODA TO HANDLE LONGER DUMP TIME
0003  C   IT SHOULD BE USED WITH &CINFF AND &CINSF.
0004  C
0005  C   THIS IS THE FIRST OF THREE PROGRAM FOR REDUCING
0006  C   EXPERIMENTAL DATA.  INPUT IS ON TAPE UNIT 18.
0007  C   OUTPUT IS TO A DISK FILE.   SOME OUTPUT IS ALSO
0008  C   SENT TO THE  LINE PRINTER AND TAPE UNIT 8
0009  C   SIMULTANEOUSLY.  THIS PROGRAM'S OUTPUT (DISK FILE)
0010  C   IS USED AS INPUT TO CINFER.
0011  C   THIS PROGRAM IS CONSTRUCTED TO HANDLE A MAXIMUM OF 20
0012  C   CHANNELS WITH A TOTAL OF 350 SCANS OF DATA PER CHANNEL.
0013  C   THIS IS AVERAGED DATA SO IT CORRESPONDS TO 350 SECONDS.
0014  C   IN ORDER TO PUT THE FULL 350 SCANS INTO THE OUTPUT DISC FILE,
0015  C   THE VARIABLE NTH MUST BE CHANGED(SEE LINE 725).
0016  C
0017  C   NOTE!!!!! THIS PROGRAM HAS TO BE MODIFIED DEPENDING WHETHER THE
0018  C             DATA IS FROM THE 200 OR 10000 CU FT CHAMBER. SEE LINES
0019  C             296, 301 AND 306. THE LOGIC FUNCTION SWITCH, CHANNEL
0020  C             63 IS DIFFERENT,LINE 306. THE PRESSURE TRANSDUCERS
0021  C             OUTPUT IS DIFFERENT IN THE TWO CHAMBERS.
0022  C
0023  C             THE CONSTANTS FOR NOZZLE DIAMETER AND CHAMBER VOLUME
0024  C             AN AND VT RESPECTIVELY MUST BE MODIFIED.
0025  C
0026  C      DOCUMENTED BY ALAN BRODER   3/3/80
0027  C      COMMENTED BY ANDREA HUNTER  7-30-80
0028  C      MODIFIED BY FRED W  WILLIAMS 810408
0029  C
0030        PROGRAM PRODF
0031        DOUBLE PRECISION AG
0032        REAL NT1,NT2,NT(350)
0033        INTEGER AK2(140)
0034        DIMENSION AK(70),IBUF(144),NAME(3),ISIZE(2),X(350,20)
0035        INTEGER AC(5),IOBUF(100)
0036        DIMENSION A(40),NC(20),X1(20),X2(20),IS(50
0037       1O),XT(20),NCT(20)
0038        LOGICAL F,FLAG,F2
0039        COMMON IPAR(5)
0040        EQUIVALENCE (AK2,AK)
0041        DATA XES/4HXXXX/
0042        DATA IBLANK/2H  /
0043  C
0044  C*****************************************************
0045  C*             VARIABLE DEFINITIONS                  *
0046  C*  A-TITLE OF FILE                                  *
0047  C*  AC-'CHANNEL'                                     *
0048  C*  IS-FUNCTION SWITCH                               *
0049  C*  NAME-UNIQUE NAME ISSUED TO OUTPUT FILE           *
0050  C*  NC-CHANNEL NUMBERS                               *
0051  C*  NT-TIMES FOR EACH SCAN                           *
0052  C*  NT1-BEGINNING TIME OF RUN                        *
0053  C*  NT2-TIME OF CURRENT SCAN                         *
0054  C*  X,X1,X2-DATA PER SCAN                            *
0055  C*                                                   *
0056  C*****************************************************
0057  C
0058  C
```

```
      IOUT=8
C
C
C
C  READ IN AND WRITE OUT FILE LABEL AND CHANNEL NUMBERS
C
      CALL RMPAR(IPAR)
      WRITE(IPAR(1),1000)
1000  FORMAT('$GIVE CARTRIDGE #,OUTPUT FILE NAME
     1.'(I5,A6)')
      READ(IPAR(1),1002)ICR,NAME
1002  FORMAT(I5,1X,3A2)
      ISIZE(1) = -1
      ITYPE = 3
C
C     CREATE A DISK FILE
C
      CALL CREAT(IBUF,IERR,NAME,ISIZE,ITYPE,IOUN,ICR)
      IF(IERR.LE.0)CALL ERR(IERR,37)
      CALL OPEN(IBUF,IERR,NAME)
1005  READ(18,1)(A(I),I=1,20)
C
C    CHECK IF WE HAVE REACHED THE END OF FILE
C
      IF(A(1).EQ.XES)GO TO 9090
 1    FORMAT(20A4)
      READ(18,2)AC,(X1(I),I=1,10)
 2    FORMAT(1X,5A2,10F10.1)
      DO 3 I=1,10
 3    NC(I)=X1(I)
C     WRITE(IOUT,4)(A(I),I=1,20),AC,(NC(I),I=1,10)
 4    FORMAT(1H1,20A4//1H ,5A2,10I6/11H    I   TIME)
C
C  SKIP A LINE OF INPUT
C
      READ(18,55)GAR1,GAR2,GAR3
 55   FORMAT(3A4)
C
C  READ IN TIME AND 1ST 10 COLUMNS OF DATA FOR THAT TIME
C
      READ(18,5)MH,AH,MM,AM,MS,(X1(I),I=1,10)
 5    FORMAT(1X,I4,A1,I2,A1,I2,10F10.1)
C
C  CONVERT TIME TO TIME IN SECONDS
C
      NT1=MS+MM*60.+MH*3600.
C
C  F WILL BE SET WHEN THERE IS NO DATA LEFT
C
      F=.FALSE.
C
C  J WILL POINT TO CURRENT LINE OF DATA IN THE X ARRAY
C
      J=0
C
C  READ IN DATA, CONVERT TIME TO SECONDS
C
 6    READ(18,5)MH,AH,MM,AM,MS,(X2(I),I=1,10)
      NT2=MS+MM*60.+MH*3600.
      IF(NT2.EQ.0.0)F=.TRUE.
```

```
C
C   IF BAD DATA GO BACK FOR MORE
C
        IF(NT2.GT.NT1+2.OR.(NT2.LT.NT1.AND..NOT.F))GO TO 6
C
C   GO TO 8 IF YOU HAVE TO INTERPOLATE
C
        IF(NT2.NE.NT1)GO TO 8
C
C   AVERAGE DATA AND GO BACK FOR NEXT LINE IF NOT EOF
C
        DO 7 I=1,10
  7     X1(I)=0.5*(X1(I)+X2(I))
        IF(F)GO TO 100
        GO TO 6
C
C   STORE GOOD LINE OF DATA IN X ARRAY,CREATE NEXT GOOD LINE,
C   (INTERPOLATING IF NECESSARY), WRITE OUT LINE JUST STORED
C   IN X ARRAY THIS IS DATA ONLY, TIME IS STORED IN NT.
C
  8     J=J+1
        NT(J)=NT1
C
C       DT-DIFFERENCE IN BEGINNING TIME AND CURRENT SCAN TIME
C
        DT=NT2-NT1
        DO 9 I=1,10
        X(J,I)=X1(I)
  9     X1(I)=X1(I)+(X2(I)-X1(I))/DT
        NT1=NT1+1
C       WRITE(IOUT,10)J,NT(J),(X(J,I),I=1,10)
 10     FORMAT(1H ,I3,F7.0,10F6.1)
        IF(NT2.GT.NT1)GO TO 8
        IF(F)GO TO 100
        GO TO 6
C
C   NJ WILL POINT TO BOTTOM OF DATA IN X ARRAY
C
 100    NJ=J
C
C   NOW DO SAME THINGS TO 2ND 10 COLUMNS OF DATA FOR
C   THE SAME TIMES.
C
        READ(18,1)(A(I),I=21,40)
        READ(18,2)AC,(X1(I),I=11,20)
        DO 101 I=11,20
 101    NC(I)=X1(I)
C       WRITE(IOUT,4)(A(I),I=21,40),AC,(NC(I),I=11,20)
C
C       SKIP A LINE OF INPUT
C
        READ(18,55)GAR1,GAR2,GAR3
C
C       READ IN TIME AND 2ND 10 COLUMNS OF DATA FOR THAT TIME
C
 102    READ(18,5)NH,AH,NM,AM,NS,(X1(I),I=11,20)
C
C       CONVERT TIME TO TIME IN SECONDS
C
        NT1=NS+NM*60.+NH*3600.
```

```
      IF(NT1.LT.NT(1))GO TO 102
C
C     F WILL BE SET WHEN THERE IS NO DATA LEFT ALSO F2
      F=.FALSE.
      F2 = .FALSE.
      J=NT1-NT(1)
      NJ0=J+1
C
C     READ IN DATA ,CONVERT TIME TO SECONDS
C
  103 READ(18,5)HH,AH,MM,AM,MS,(X2(I),I=11,20)
      NT2=MS+MM*60.+HH*3600.
      IF(NT2.GT.NT1+2)GO TO 103
      IF(NT2.EQ.0)F2=.TRUE.
C
C     GO TO 105  IF YOU HAVE TO INTERPOLATE
C
      IF(NT2.NE.NT1)GO TO 105
C
C     AVERAGE DATA AND GO BACK FOR NEXT LINE IF NOT EOF
C
      DO 104 I=11,20
  104 X1(I)=0.5*(X1(I)+X2(I))
      GO TO 103
C
C     STORE GOOD LINE OF DATA IN X ARRAY, CREATE NEXT GOOD LINE,
C     (INTERPOLATING IF NESSACARY),WRITE OUT LINE JUST STORED
C     IN X ARRAY.
C
  105 J=J+1
      IF(J.GT.NJ)F=.TRUE.
      NT(J)=NT1
      DT=NT2-NT1
      DO 106 I=11,20
      X(J,I)=X1(I)
  106 X1(I)=X1(I)+(X2(I)-X1(I))/DT
      NT1=NT1+1
C     WRITE(IOUT,10)J,NT(J),(X(J,I),I=11,20)
      IF(NT2.GT.NT1)GO TO 105
      IF(.NOT.(F.OR.F2))GO TO 103
      IF(F2)GO TO 108
  107 READ(18,5)HH,AH,MM,AM,MS
      IF(HH.NE.0.OR.MM.NE.0.OR.MS.NE.0)GO TO 107
C
C  NJM WILL NOW POINT TO BOTTOM OF LAST COMPLETE SET OF DATA
C  (COMPLETE = ALL 20 COLUMNS OF DATA). IT IS DETERMINED WHETHER CHANNELS
C  60-69 OR 70-79 HAS THE LEAST NUMBER OF SCANS AND IS RETURNED TO NJM.
C
  108 NJM=NJ
      IF(J.LT.NJ)NJM=J
C
C  PRINT OUT HEADINGS AND COLUMN HEADINGS WITH
C  CHANNEL NUMBERS REARRANGED.
C
C**************************************************************
C*  THIS IS THE ARRANGEMENT OF CHANNEL NUMBERS IN ONE ARRAY, THE  *
C*  SECOND ARRAY CONTAINS THE CHANNEL NUMBERS REARRANGED IN A     *
C*  PRE-DETERMINED ORDER.                                         *
C*------------------------------------------------------------*
C*                DEFINITION OF HEADERS                          *
```

```
C*   CHANNEL NUMBERS-CHANNELS 60-79                                        *
C*   ARRAY #1-(NC) THE ORIGINAL ORDER OF CHANNEL NUMBERS IN                *
C*                        ASCENDING ORDER                                  *
C*   ARRAY #2-(NCT) ALTERED ORDER OF CHANNEL NUMBERS                       *
C*   LOCATION- THE POSITION OF PURPOSE OF CHANNEL NUMBERS                  *
C*-------------------------------------------------------------------------*
C*-------------------------------------------------------------------------*
C*   ARRAY #1     CHANNEL NUMBER      ARRAY #2      LOCATION               *
C*   --------     --------------      --------      --------               *
C*     NC(1)            60             NCT(1)       PRESSURE               *
C*     NC(2)            61             NCT(3)       PRESSURE               *
C*     NC(3)            62             NCT(10)      TEMPERATURE(C)         *
C*     NC(4)            63               *          FUNCTION               *
C*     NC(5)            64             NCT(16)      TEMPERATURE(C)         *
C*     NC(6)            65             NCT(15)      TEMPERATURE(C)         *
C*     NC(7)            66             NCT(14)      TEMPERATURE(C)         *
C*     NC(8)            67             NCT(13)      TEMPERATURE(C)         *
C*     NC(9)            68             NCT(12)      TEMPERATURE(C)         *
C*     NC(10)           69             NCT(11)      TEMPERATURE(C)         *
C*     NC(11)           70             NCT(2)       NOZZLE ENTRANCE        *
C*     NC(12)           71             NCT(6)       TEMPERATURE(C)         *
C*     NC(13)           72               *          TANK 1 EXIT            *
C
C*     NC(14)           73               *          NOZZLE THROAT          *
C*     NC(15)           74             NCT(7)       TEMPERATURE(C)         *
C*     NC(16)           75             NCT(5)       TEMPERATURE(C)         *
C*     NC(17)           76             NCT(8)       TEMPERATURE(C)         *
C*     NC(18)           77             NCT(4)       TEMPERATURE(C)         *
C*     NC(19)           78             NCT(9)       TEMPERATURE(C)         *
C*     NC(20)           79               *          TANK 1                 *
C*-------------------------------------------------------------------------*
C*NOTE:*********************************************************************
C* (*) INDICATES NO CORRESPONDENCE TO THIS LOCATION                        *
C*-------------------------------------------------------------------------*
C***************************************************************************
C
      NCT(1)=NC(1)
      NCT(2)=NC(11)
      NCT(3)=NC(2)
      NCT(4)=NC(18)
      NCT(5)=NC(16)
      NCT(6)=NC(12)
      NCT(7)=NC(15)
      NCT(8)=NC(17)
      NCT(9)=NC(19)
      NCT(10)=NC(3)
      NCT(11)=NC(10)
      NCT(12)=NC(9)
      NCT(13)=NC(8)
      NCT(14)=NC(7)
      NCT(15)=NC(6)
      NCT(16)=NC(5)
C     WRITE(IOUT,200)(A(I),I=1,20),(NCT(I),I=1,16),(I,I=1,16)
  200 FORMAT(1H1,1X,20A4/18H0CHANNEL OF ORIGIN,I4,15I6/1H ,5X1HI,9X,16I6
     1,6H VALVE/,0H    J  TIME)
C
C  REARRANGE THE ORDER OF THE COLUMNS OF DATA.
C  ALSO MOVE THE FIRST GOOD ROW OF DATA TO THE
C  TOP OF THE ARRAY  THEN DUMP OUT DATA TO THE
C  LINE PRINTER  (THE DO 202 LOOP SCALES
```

```
C  CHANNELS 60 AND 61 AND SETS ARRAY IS(N) WHEN
C  THE NOZZLE IS ON.)
C
C
C   WRITE THE VALUE OF NJO
C
          WRITE(IPAR(1),1111)NJO,NJM
 1111     FORMAT("NJO=",I8,"NJM=",I8)
        DO 206 K=NJO,NJM
        J=K+1-NJO
        NT(J)=NT(K)
        IS(J)=0
        DO 202 I=1,20
C
C       CONVERT TANK 1 (CHANNEL 60) TRANSDUCER TO PASCAL'S
C       PER SQUARE METER PRESSURE, FOR THE 200 CU FT CHAMBER THE MULT
C       FACTOR IS 0.15 WHERE AS FOR THE 10,000 CU FT CHAMBER THE FACTOR
C       IS 0.1
C
        IF(NC(I).EQ.60)X(K,I)=X(K,I)*0.15/14.7
C
C       CONVERT CHAMBER(CHANNEL 61) TRANSDUCER TO PASCAL'S
C       PER SQUARE METER PRESSURE, FOR THE 200 CU FT CHAMBER THE MULT
C       FACTOR IS 0.05 WHERE AS FOR THE 10,000 CU FT CHAMBER THE FACTOR
C       IS 0.001
C
        IF(NC(I).EQ.61)X(K,I)=X(K,I)*0.050/14.7
C
C       DETERMINE IF THE FUNCTION SWITCH(CHANNEL 63) IS
C       ON OR OFF  FOR THE 200 CU FT CHAMBER THE TRIGGER LEVEL SHOULD BE
C       5.0 WHERE AS FOR THE 10,000 CU FT CHAMBER THE LEVEL IS 1000.0.
C
        IF(NC(I).EQ.63 AND.ABS(X(K,I)).GT.5.0000)IS(J)=1
C
C       THE FIRST SUBSCRIPT OF X ARRAY  J=THE NTH SCAN #
C       AND THE SECOND SUBSCRIPT HOLD THE CHANNEL NUMBER
C
  202   X(J,I)=X(K,I)
        XT(1)=X(J,1)
        XT(2)=X(J,11)
        XT(3)=X(J,2)
        XT(4)=X(J,18)
        XT(5)=X(J,16)
        XT(6)=X(J,12)
        XT(7)=X(J,15)
        XT(8)=X(J,17)
        XT(9)=X(J,19)
        XT(10)=X(J,3)
        XT(11)=X(J,10)
        XT(12)=X(J,9)
        XT(13)=X(J,8)
        XT(14)=X(J,7)
        XT(15)=X(J,6)
        XT(16)=X(J,5)
        DO 204 I=1,16
  204   X(J,I)=XT(I)
C       WRITE(IOUT,208)J,NT(J),(X(J,I),I=1,16),IS(J)
 206    CONTINUE
  208   FORMAT(1H ,I3,F7.0,6X,F6.3,F6.1,F6.3,13F6.1,I6)
C
```

```
C  WRITE OUT NEW PAGE HEADERS, AND DUMP OUT CHART OF DATA
        WRITE(IOUT,700)(A(I),I=1,20),(I,I=1,13)
  700   FORMAT(1H1,20A4//7X10HPRESSURANT   FILL-,5X13HTHERMOCOUPLES/6X12HFL
       1OW - TOTAL 3X4HTANK 5X10HLOCATION I,27X11HCOORDINATES/1X4HTIME,3X1
       28H 8X4H? ?X1H? 7X8HT(DEG K) 74X16HI   R   THETA  Z/1X24H(SEC)(BAR)
       3(DEG K)  (BAR),2X13I6,10X14H(M)  (DEG) (M))
        CALL CODE
C
C  INITIALIZE TABLE OF OUTPUT CONSTANTS
C
        WRITE(AK2,209)
  209   FORMAT(10H 1  0.000 ,10H 00 -0.586,10H 2  0.000 ,10H 00 -0.293,10
       1H 3  0.000 ,10H 00  0.000,10H 4  0.000 ,10H 00  0.293,10H 5  0.000
       2 ,10H 00  0.586,10H 6  0.000 ,10H 00  0.878,10H 7  0.000 ,10H 00
       31.049,10H 8  0.000 ,10H 00  2.342,10H 9  0.000 ,10H 00  2.635,10H1
       40  0.000 ,10H 00  2.928,10H11  0.000 ,10H 00  3.220,10H12  0.000 ,
       510H 00  3.513,10H13  0.000 ,10H 00  3.806,5(4H    ))
        DATA AG/6H  *** /
  701   FORMAT(1X,I4,F6.3,F6.1,F8.3,4X,13F6.1,4X,5A4)
  702   FORMAT(1X,I4,2A6,F8.3,4X,13F6.1,4X,5A4)
        FLAG=.TRUE.
C
C  FIND WHERE NOZZLE WAS TURNED ON AND OFF.
C  KO POINTS TO ON POSITION
C  KP POINTS TO OFF+1 POSITION
C
        DO 300 K=1,J
        IF(IS(K).EQ.1.AND.FLAG)KO=K
        IF(IS(K).EQ.1.AND.FLAG)FLAG=.FALSE.
        IF(IS(K).EQ.0.AND..NOT.FLAG)KP=K
  300   IF(IS(K).EQ.0.AND..NOT.FLAG)FLAG=.TRUE.
        TO=10
        TP=TO+KP-KO+1
C
C  SHOW EVERY SECOND OF DATA TILL KP+10 SECONDS
C  THEN SHOW EVERY 5 SECONDS OF DATA TILL KP+60 SECONDS
C  THEN SHOW EVERY 10 SECONDS OF DATA PAST KP+60 SECONDS
C  NOTE!!!! THIS SECTION MAY TAKE A LITTLE WORK TO GET ALL THE
C  SCANS OUT.
C
        K1=KO-10
        K2=K1+49
        JMAX=NJM-K1
        J=K1+4
D          WRITE(IPAR(1),606) JMAX,KP,KO,K1,K2
D606       FORMAT(" JMAX=",I4,"KP=",I4,"KO=",I4,"K1=",I4,"K2=",I4)
        L=0
  710   L=L+1
        IF(L.GT.JMAX)GO TO 725
        J=J+1
        IF(J.LE.KP+10)GO TO 715
        J=J+4
        IF(J.LE.KP+60)GO TO 715
        J=J+5
  715   IF(J.GT.JMAX)GO TO 725
        ITM=NT(J)-NT(KO)
        XT(1)=X(J,1)
        XT(2)=X(J,2)+273.2
        XT(3)=X(J,3)
        DO 717 I=4,16
```

```
 717  XT(I)=X(J,I)+273.2
      IF(J.LT.KO.OR.J.GT.KP+2)GO TO 720
      L2=5*L-4
      IF(L.GT.13)L2=66
      WRITE(IOUT,701)ITM,(XT(I),I=1,16),(AK(I),I=L2,L2+4)
      GO TO 710
 720  L2=5*L-4
      IF(L.GT.13)L2=66
      WRITE(IOUT,702)ITM,AG,AG,(XT(I),I=3,16),(AK(I),I=L2,L2+4)
      GO TO 710
C
C  DUMP OUT DATA TO DISK THAT WILL BE USED AS INPUT
C  TO CINFER
C
C  NOTE!!  IF NTH IS SET TO JMAX ALL THE DATA THAT IS ON THE PRODA
C  TAPE WILL OUTPUT TO THE PRODA OUTPUT DISC FILE  THE TAPE OUTPUT
C  REFLECTS ALL THE DATA, BUT FOR THE LONGER TIMES, NOT ALL THE DATA
C  IS SHOWN AS SOME SCANS ARE SKIPPED.
C  OTHERWISE SET NTH TO A SPECIFIC NUMBER, REMEMBER TO MODIFY THE NEXT
C  PROGRAM FOR THE PROPER NUMBER OF SCANS.
C
 725  FLAG=.TRUE.
      NTH=JMAX
       IF(JMAX.GE. 149) NTH=149
C     NTH REPRESENTS NT IN PROGRAM CINFER
C     NTI= NUMBER OF THERMOCOUPLES
C     DT=  TIME SERIES NOMINAL INCREMENT (SEC)
C     AN=  NOZZLE NOMINAL AREA(CM**2)
C     VT=  TANK VOLUME(M**3)
C     CF=  FLOW COEFICIENT    (SEE NOTES IN CINFR)
C     GA=  SPECIFIC HEAT RATIO("    "     "    "  )
C     WA=  MOL WT OF AIR      ("    "     "    "  )
C     WP=  MOL WT OF PRESSURANT("   "     "    "  )
C
      NTI=13
      DT=1.0
      AN=0.010
      VT=5.1
      CF=0.0
      GA=0.0
      WA=0.0
      WP=0.0
      NUM=40
C
C     POSITION RECORD IN REFERENCE TO FILE
C
      CALL WRITF(IBUF,IERR,A,NUM)
      IF(IERR.LT.0)CALL ERR(IERR,304)
      CALL CODE
C
C    WRITE DATA TO DISK
C
      WRITE(IOBUF,302)NTI,NTH,DT,TO,TP,AN,VT,CF,GA,WA,WP
 302  FORMAT(2I4,9F7.3,1H )
      NUM = 36
      CALL WRITF(IBUF,IERR,IOBUF,NUM)
      IF(IERR.LT.0)CALL ERR(IERR,310)
C  NOTE!!!!! THIS STATEMENT MAY STILL NEED WORK!!!!
       K4=NTH+K1-1
      DO 303 J=K1,K4
```

```
      CALL CODE
C
C     WRITE OUT DATA TO DISK
C
      WRITE(IOBUF,304)X(J,3),X(J,1),X(J,2),(X(J,I),I=4,16)
 304  FORMAT(F8.3,F7.3,14F5.1,' ')
      NUM = 43
      CALL WRITF(IBUF,IERR,IOBUF,NUM)
      IF(IERR.LT.0)CALL ERR(IERR,317)
303   CONTINUE
C
C     CHECK TO SEE IF EOF
C
      GO TO 1005
9090  DO 9091 I=1,100
C
C    WRITE OUT A LINE OF BLANKS
C
9091  IOBUF(I)=IBLANK
C
C     LOOKING FOR THE EOF MARKER
C
      CALL WRITF(IBUF,IERR,XES,2)
      IF(IERR.LT.0)CALL ERR(IERR,323)
      DO 9092 I=1,4
      CALL WRITF(IBUF,IERR,IOBUF,100)
9092  IF(IERR.LT.0)CALL ERR(IERR,326)
C
C     DETERMINE THE ACTUAL LOCATION OF THE RECORD POINTER
C
      CALL LOCF(IBUF,IERR,IDUM,IRB,IDUM,JSEC)
      IF(IERR.LT.0)CALL ERR(IERR,328)
      ITRUN = JSEC/2 - (IRB +1)
C
C     CLOSE  THE DISK FILE
C
      CALL CLOSE(IBUF,IERR,ITRUN)
      IF(IERR.LT.0)CALL ERR(IERR,331)
C
      WRITE(IPAR(1),2000)NAME
 2000 FORMAT ('AT THIS POINT PRODA IS FINISHED WITH ',3A2)
      STOP
 1919 FORMAT('DANGER IERR=',I6)
      END
C
C*************************************************************
C     SUBROUTINE TO PRINT OUT FMP ERRORS AS THEY OCCUR
C     FMP ERROR DESCRIPTIONS ARE LOCATED IN
C     'RTE 4B PROGRAMMER'S RET SPOOLING MANUAL'
C
      SUBROUTINE ERR(IER,LINE)
      COMMON IPAR(5)
      WRITE (IPAR(1),9999)IER,LINE
 9999 FORMAT ('IER=',I8,'LINE NUMBER =',I8)
      RETURN
      END
C****************************************************************
      END$
```

APPENDIX B

Program CINFR accepts data from PRODF and produces the B-tables [6].

```
&CINFF T=00004 IS ON CR00056 USING 00062 BLKS R=0000

FTN4
      PROGRAM CINFR
C
C     NOTE!!! THIS IS A MODIFIED FORM OF CINFR TO HANDLE LONGER DUMP TI
C     IT SHOULD BE USED WITH &PRODF AND &CINSF.
C      THIS PROGRAM IS THE SECOND OF THREE IN THE SERIES OF DATA
C      REDUCING PROGRAMS.  INPUT IS THE OUTPUT DISC FILE
C      FROM PROGRAM PRODA AND OUTPUT IS TO A DISC FILE.
C
C      IF THE NUMBER OF INPUT SCANS FOR THIS PROGRAM CHANGES, THE FOLLO
C      BUFFERS MUST BE REVISED, TI(NTI,NT),TIN(NT),P(NT),PS(NT),TS(NT),
C      FLIN(NT),TB(NT),CN(NT),BTA(NT),TAR(NT),TPRS(NT),PB(NT),BTTS(NT).
C
C      NOTE!!!!! THE AREA OF THE NOZZLES MUST BE VARIED ALONG WITH THE
C      VOLUME OF THE CHAMBER IF IT IS CHANGED.
C          PROGRAM WRITTEN BY PROF R. C. CORLETT
C          ADAPTED FOR USE AT NRL BY ALLEN BRODER
C          MODIFIED AND COMMENTED BY F.W.WILLIAMS 810408
C
      DIMENSION TI(13,150),TIN(150),P(150),PS(150),TS(150),A(10),XP(20),
     1FLIN(150),TB(150),CN(150),BTA(150),TAIR(150),TPRS(150),XPB(150),B1
     2TS(150)
      INTEGER IPAR(5),IBUF(144),OBUF(144),IOBUF(100),ISIZE(2)
      INTEGER NAME(3),NAME2(3)
      INTEGER CBUF1(32),CBUF2(61),CBUF3(12),CBUF4(9),CBUF5(12),CBUF6(10
      LOGICAL FI
      DATA XES/4HXXXX/
      DATA IBLANK/2H  /
C
      CALL RMPAR(IPAR)
1011  FORMAT('0 TIME  TEMP(DEG C)',9X,'BETA BETA'
     1,'/TSTAR PRESSURANT FRACTION ')
CC1012  FORMAT('0MAXIMUM OVERESTIMATE OF PRESSURANT FRACTION',
CC   1' DUE TO PLACEMENT IN INLET JET IS (TMEAN - TPRESS)/'
CC   2'(TAIR - TPRESS) * 3/20.     ')
1013  FORMAT('0COMMENCE VALVE OPENING ')
1014  FORMAT(' VALVE FULLY OPEN ')
1015  FORMAT(' COMMENCE VALVE CLOSURE ')
1016  FORMAT(' VALVE FULLY CLOSED ')
C
C     WRITE OUT HEADINGS TO DISC
C
      CALL CODE
      WRITE(CBUF1,1011)
CC    CALL CODE
CC    WRITE(CBUF2,1012)
      CALL CODE
      WRITE(CBUF3,1013)
      CALL CODE
      WRITE(CBUF4,1014)
      CALL CODE
      WRITE(CBUF5,1015)
      CALL CODE
      WRITE(CBUF6,1016)
      WRITE(IPAR(1),1000)
C
C     INPUT NAME IS THE PRODA OUTPUT FILE NAME
C
```

```
      CALL CINAV(IBUF,TBUF)
C
C  REWIND TEMPORARY FILE SO THAT IT CAN BE USED FOR
C  INPUT BY CINFV
C
      CALL RWNDF(TBUF,IERR)
      IF(IERR.LT.0)CALL ERR(IERR)
C
C  CINFV IS A SUBROUTINE THAT AVERAGES THE CASES FOR THE STATISTICAL
C  ANALYSIS AND PREFORMS THE STATISTICS. MEAN VALUE OF ALL QUANTITIES
C  NORMALIZED MEAN LOCAL PRESSURANT FRACTIONS, VARIANCES OF MEAN
C  LOCAL PRESSURANT FRACTIONS AND DEVIATIONS OF MEAN LOCAL PRESSURANT
C  FRACTIONS.
C
      CALL CINFV(TBUF,OBUF)
C
C  DELETE TEMPORARY FILE
C
      CALL PURGE(TBUF,IERR,TNAME)
      IF(IERR.LT.0)CALL ERR(IERR)
C
C  INITIALIZE AND WRITE OUT PADDING BUFFER TO END OF OUTPUT FILE
C
CC        TBUF(101)=13
        DO  5  I=1,100
   5    TBUF(I)=IBLANK
        DO  10  I=1,4
            CALL WRITF(OBUF,IERR,TBUF,100)
  10    IF(IERR.LT.0) CALL ERR(IERR)
C
C  CLOSE AND TRUNCATE OUTPUT FILE TO CORRECT SIZE
C
      CALL LOCF(OBUF,IERR,IDUM,IRB,IDUM,ISEC)
      IF(IERR.LT.0)CALL ERR(IERR)
      ITRUN = ISEC/2  -  (IRB + 1)
      CALL CLOSE(OBUF,IERR,ITRUN)
      IF(IERR.LT.0)CALL ERR(IERR)
C
C  WRITE OUT MESSAGE THAT CINST HAS FINISHED.
C
      WRITE(IPAR(1),2000) ONAME
2000  FORMAT(" AT THIS POINT CINST IS FINISHED WITH ",3A2)
      STOP
      END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
      SUBROUTINE ERR(IERR,LINE)
C  THIS SUBROUTINE WRITES OUT THE ERROR # PASSED TO
C  IT, AND THEN HALTS THE PROGRAM. THESE ERRORS ARE FOR FMP
C  CALLS. IN SOME CASES THE LINE NUMBER IS GIVEN.
C
      INTEGER IERR,IPAR(5)
      COMMON IPAR
      WRITE(IPAR(1),10)IERR,LINE
   10 FORMAT(' IERR = ',I6,' LINE NUMBER=',I8)
      STOP
      END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
```

```
C
      SUBROUTINE CINAV(INBUF,OUTBUF)
      INTEGER INBUF(144),OUTBUF(144),IOBUF(100)
      DIMENSION D(101,25),DI(50,21)
      DATA IBLANK/2H  /
      DATA NC/99/
      DATA IXES/2HXX/
      DATA ICO/2H V/
C READ IN THE FIRST RECORD FROM OPEN INPUT DISC FILE
C THE LARGEST INPUT RECORD IS CONTROLLED BY THE SIZE OF IOBUF,
C WHICH CURRENTLY IS 100,SEE DIMENSION STATEMENT.
  1   CALL READF(INBUF,IERR,IOBUF)
      IF(IERR.LT.0)CALL ERR(IERR,1)
C SET THE DATA ARRAY EQUAL TO 0'S
      DO 3 NTK=1,50
        DO 3 I=1,21
          DI(NTK,I)=0.0
 3    CONTINUE
C TEST TO SEE IF YOU ARE AT THE END OF THE FILE(LOOKING FOR "XX")
      IF(IOBUF(1).EQ.IXES)GO TO 9090
C READ THE NEXT THREE RECORDS FROM THE OPEN INPUT DISC FILE
      DO 101 I=1,3
          CALL READF(INBUF,IERR,IOBUF,101)
 101  IF(IERR.LT.0)CALL ERR(IERR)
C READS IN 101 LINES OF DATA, STORING ONLY DATA AND DISREGUARDING
C TITLE LINES. TO CHANGE THE AMOUNT OF DATA INPUT THE DIMENSION
C STATEMENT D(101,25) MUST BE CHANGED ALONG WITH DO LOOP 20,30
C LINE AFTER 210.
      DO 10 NT=1,101
 9        CALL READF(INBUF,IERR,IOBUF)
          IF (IERR.LT.0)CALL ERR(IERR,9)
          IF(IOBUF(1).EQ.ICO)NTC=NT-1
C  TEST THIRD CHARACTER TO BE A NUMBER
          ITEST=(IAND(IOBUF(2),177B))-60B
          IF(ITEST.LT.0.OR.ITEST.GT.9) GOTO 9
          CALL CODE
          READ(IOBUF,110)(D(NT,I),I=1,20)
D         WRITE(6,110)(D(NT,I),I=1,20)
 110      FORMAT(4F6.1,F8.1,F8.4,F12.3,F8.3,12F6.3)
 10   CONTINUE
C
C  CREATE A NEW COLUMN OF DATA(25TH) WHICH IS DERIVED FROM N/NO
C  WHERE N=NO. OF MOLES AT TIME T AND NO= INITIAL NO. OF MOLES.
C
      DO 20 NT=1,101
          D(NT,25)=1.0/(1.0-D(NT,7))
 20   CONTINUE
C
C  CALCULATE TC CONSIDERING TAU 7 AND TAU 5 . NTC=9
C
      TC=2.0/ALOG(D(NTC-2,25)/D(NTC-4,25))
C CALCULATE A TAU, CREATES A NEW COLUMN OF DATA(24TH) WHICH IS TIME
C NORMALIZED.  IT IS NORMALIZED TO FULL VALVE CLOSURE AS 1.00.
C TAU=XBAR/XBAR SUB C.
C
      DO 30 NT=1,101
          D(NT,24)=D(NT,7)/D(35,7)
          DTC=NT-NTC-1
          IF(NT.GT.NTC)D(NT,24)=1.0+DTC/TC
 30   CONTINUE
```

```
C
C  CREATES A NEW ARRAY,DI(50,21)
C
      DO 200 I=1,20
         DI(1,I)=D(1,I)
 200  CONTINUE
C
C  CONSTANTS
C
      NT=1
      NTK=2
      TAUK=0.05
 210  NT=NT+1
      IF(NT.GT.101)GO TO 300
 215  IF(D(NT,24).LT.TAUK)GO TO 210
C
C  SIZE OF THE TIME INCREMENT IN THE TAU TABLE.
C
      DD24=D(NT,24)-D(NT-1,24)
C
C  INTERPOLATES FOR THE NEW TABLE NORMALIZED TO TAU AND
C  BUILDS A NEW ARRAY, DI(50,21)
C
      DO 220 I=1,20
         DI(NTK,I)=D(NT-1,I)
         IF(DD24.GT.0.0001)DI(NTK,I)=DI(NTK,I)+(D(NT,I)-D(NT-1,I))
     1   *(TAUK-D(NT-1,24))/DD24
 220  CONTINUE
      IF(NTK.GE.50)GO TO 300
      NTK=NTK+1
      TAUK=TAUK+0.05
      GO TO 215
 300  TAUKN=TAUK-0.05
D     WRITE(6,150)TC,TAUKN,NC,NTC
C WRITE           VALUES TO THE TEMPORARY DISC FILE
 150  FORMAT(1H1,2F10.2,2I10,1H )
C
C  WRITE OUT SELECTED VALUES TO THE TEMPORARY DISC FILE,TMPBUF:
C           TC=
C           TAUKN=
C           NC=
C           NTC= SCAN WHERE THE VALVE IS FULLY CLOSED.
C
      CALL CODE
      WRITE(IOBUF,150)TC,TAUKN,NC,NTC
      CALL WRITF(OUTBUF,IERR,IOBUF,21)
      IF(IERR.LT.0)CALL ERR(IERR,160)
C WRITE THE DATA TO THE TEMPORARY DISC FILE "TMPBUF"
      DO 310 NTK=1,50
         DNTK=NTK-1
         DI(NTK,21)=0.05*DNTK
 160     FORMAT(1H ,F5.1,3F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2,1H )
         CALL CODE
         WRITE(IOBUF,160)(DI(NTK,I),I=1,21)
         CALL WRITF(OUTBUF,IERR,IOBUF,66)
         IF(IERR.LT.0)CALL ERR(IERR,310)
 310     CONTINUE
C
C  PICK UP THE NEXT CASE TO PROCESS
C
```

```
            GO TO 1
C
C  WRITE OUT A LINE OF BLANKS AT THE END OF TEMPORARY FILE.
C
9090         IOBUF(101)=13
                DO 9091    I=1,100
9091            IOBUF(I)=IBLANK
                CALL WRITF(OUTBUF,IERR,IOBUF,101)
                IF(IERR.LT.0)CALL ERR(IERR,9091)
            RETURN
            END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
            SUBROUTINE CINFV(INBUF,OUTBUF)
            INTEGER INBUF(144),OUTBUF(144),IOBUF(100),CBUF1(65),CBUF2(63)
            DIMENSION S1(50,21),S2(50,21),SG(50,21),DS(50,21)
C
C  ZEROS ALL THE ARRAYS WHERE S1 WILL BE SUMS,S2 SUM OF SQUARES,SG
C              ,AND DS
C
 1          DO 10 NT=1,50
              DO 10 I=1,21
                S1(NT,I)=0.0
                S2(NT,I)=0.0
                SG(NT,I)=0.0
                BS(NT,I)=0.0
 10         CONTINUE
C
C  COUNTER FOR THE NUMBER OF CASES PROCESSED
C
            CN=-1.0
 12         CN=CN+1.0
C
C  READ IN THE FIRST LINE OF DATA FROM TEMPORARY FILE.
C
            CALL READF(INBUF,IERR,IOBUF)
            IF(IERR.LT 0)CALL ERR(IERR,12)
            CALL CODE
            READ(IOBUF,100)TC,TAUN,NC
 100        FORMAT(2F10.2,I10)
            IF(NC.EQ 0)GO TO 500
C
C  READ IN 50 LINES OF DATA FROM THE TEMPORARY FILE, WRITE THEM INTO
C  BUFFER SG(NT,I) AND ADD THEM TO BUFFER S1 AND STORE IN BUFFER S1.
C  ALSO SQUARE SG,AND ADD TO BUFFER S2 AND STORE IN S2.
C
            DO 20 NT=1,50
                CALL READF(INBUF,IERR,IOBUF)
                IF(IERR.LT.0)CALL ERR(IERR,110)
                CALL CODE
                READ(IOBUF,110)(SG(NT,I),I=1,21)
 110            FORMAT(4F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2)
              DO 20 I=1,21
                S1(NT,I)=S1(NT,I)+SG(NT,I)
                S2(NT,I)=S2(NT,I)+SG(NT,I)**2
 20         CONTINUE
C
C  REPEAT FOR ALL THE CASES IN THE TEMPORARY FILE.
C
```

```
      GO TO 12
C
C  CALCULATE THE AVERAGE MEAN PRESSURANT AT THE 21ST TIME FROM
C  WELL AFTER VALVE CLOSURE.
C
 500  XBARAV=S1(23,7)/CN
C
C  CALCULATE THE AVERAGE VALUES FOR THE X NO. OF CASES FOR ARRAY S1
C  (SUMS), S2(SUM OF SQUARES), AND SSC(SUM OF DIFFERENCE OF SQUARES)
C
      DO 520 NT=1,50
        DO 510 I=1,21
          S1(NT,I)=S1(NT,I)/CN
          S2(NT,I)=S2(NT,I)/CN
C  REINITIALIZE ARRAY SG
          SG(NT,I)=0.0
          SGG=S2(NT,I)-S1(NT,I)**2
          IF(SGG.GT.0.0)SG(NT,I)=SQRT(SGG)
          IF(I.GT.7.AND.I.LT.21)DS(NT,I)=S1(NT,I)-S1(NT,7)
          S2(NT,I)=0.0
          IF(I.GT.7.AND.I.LT.21)S2(NT,I)=S1(NT,I)/XBARAV
          DS(NT,I)=DS(NT,I)/XBARAV
          IF(I.GT.7.AND.I.LT.21)SG(NT,I)=SG(NT,I)/XBARAV
          IF(I.EQ.21)S2(NT,I)=S1(NT,
          IF(I.EQ.21)SG(NT,I)=S1(NT,I)
          IF(I.EQ.21)DS(NT,I)=S1(NT,I)
 510    CONTINUE
          IF(NT.GT.20.OR.NT.LT.5)GO TO 520
          TBAR=S1(NT,2)+273.2
          T0=S1(1,2)+273.2
          DTBAR=S1(NT,2)-S1(NT-1,2)
          SN=1.0/(1.0-S1(NT,7))
          SN1=1.0/(1.0-S1(NT-1,7))
          DLN=ALOG(SN/SN1)
          IF(DLN.LE.0.00001)GO TO 520
          BETA=S1(NT,5)
          TS=(0.4*BETA*(TBAR-T0)+TBAR+DTBAR/DLN)/1.4
          S2(NT,2)=TS-273.2
          S2(NT,6)=(S1(NT,4)-S2(NT,2))/(S1(NT,3)-S1(NT,4))/XBARAV
D   WRITE(6,997)TBAR,T0,DTBAR,SN,SN1,DLN,BETA,TS
D997      FORMAT(1H ,3F8.1,3F8.4,2F8.1)
 520  CONTINUE
 120  FORMAT(/(1H ,F5.1,3F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2))
D     WRITE(6,120)((S1(NT,I),I=1,21),NT=1,50)
C
C  WRITE A HEADING FOR THE FIRST STAT TABLE,S1
C
      CALL CODE
      WRITE(IOBUF,65)
65    FORMAT('0 MEAN VALUES OF ALL QUANTITIES  ',/)
      CALL WRITE(OUTBUF,IERR,IOBUF,17)
      IF(IERR.LT.0)CALL ERR(IERR,65)
      CALL CODE
      WRITE(CBUF1,1010)
1010  FORMAT("0  TIME",1X,"TMP,C",1X,"TMP,C",1X,"TMP,C",3X,"BETA",
     1  2X,"BETA/",3X," X ",20X,"MEAN PRESSURANT FRACTIONS AT"
     2  " LOCATIONS I",22X,"TAU")
      CALL CODE
      WRITE(CBUF2,1020)
1020  FORMAT("   SEC",2X,"INIT",2X,"     ",1X,"     ",9X,"THETA",
```

```
      1        3X,"BAR",6X,"1",5X,"2",5X,"3",5X,"4",5X,"5",5X,"6",
      2        5X,"7",5X,"8",5X,"9",5X,"10",4X,"11",4X,"12",4X,"13 ")
        CALL WRITF(OUTBUF,IERR,CBUF1,65)
        IF(IERR.LT.0) CALL ERR(IERR)
        CALL WRITF(OUTBUF,IERR,CBUF2,63)
        IF(IERR.LT.0) CALL ERR(IERR)
         CALL WRIT1(S1,OUTBUF)
C
C  WRITE A HEADING FOR THE SECOND STAT TABLE,S2
C
        CALL CODE
        WRITE(IOBUF,70)
70      FORMAT('1 NORMALIZED MEAN LOCAL'
       1,' PRESSURANT FRACTIONS ',/)
        CALL WRITF(OUTBUF,IERR,IOBUF,23)
        IF(IERR.LT 0)CALL ERR(IERR)
         CALL WRIT2(S2,OUTBUF)
C
C  WRITE A HEADING FOR THE THIRD STAT TABLE,SG
C
C
        CALL CODE
        WRITE(IOBUF,75)
75      FORMAT('1 STANDARD DEVIATION OF MEAN LOCAL'
       1,' PRESSURANT FRACTIONS  ')
        CALL WRITF(OUTBUF,IERR,IOBUF,29)
        IF(IERR.LT.0)CALL ERR(IERR)
         CALL WRIT2(SG,OUTBUF)
C
C  WRITE A HEADING FOR THE FORTH STAT TABLE,DS
C
        CALL CODE
        WRITE(IOBUF,80)
80      FORMAT('1 DEVIATIONS OF MEAN LOCAL'
       1,' PRESSURANT FRACTIONS ')
        CALL WRITF(OUTBUF,IERR,IOBUF,24)
        IF(IERR.LT.0)CALL ERR(IERR)
         CALL WRIT2(DS,OUTBUF)
C
C  WRITE THE NUMBER OF CASES TREATED
C
        NCH=CH
        CALL CODE
        WRITE(IOBUF,130)NCH
        CALL WRITF(OUTBUF,IERR,IOBUF,5)
        IF(IERR.LT.0)CALL ERR(IERR)
 130    FORMAT(1H0,I2,7H CASES )
        RETURN
        END
C
CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C
        SUBROUTINE WRIT1(AR,OUTBUF)
C
C  THIS IS A SUBROUTINE THAT OUTPUTS THE DATA TO A DISC FILE,ONAME
C  FROM ADJUST FOR THE MEAN VALUES OF ALL QUANTITIES.
C
        REAL  AR(50,21)
        INTEGER IOBUF(100),OUTBUF(144)
C
```

```
        DO 20 NT=1,50
            CALL CODE
            WRITE(IOBUF,120)(AR(NT,I),I=1,21)
  1[illegible]      FORMAT(1H [illegible]F5.1,[illegible]F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2,1H )
            CALL WRIT[illegible]OUTBUF[illegible]IERR[illegible]IOBUF,66)
  2[illegible]   I[illegible]IERR LT 0)[illegible]
        RETURN
        END
C
C[illegible]
C
        [illegible] WRIT2(AR,OUTBUF)
C
C  [illegible] A [illegible] THE [illegible] TO A DISC FILE,ONAME
C  [illegible] STANDARD DEVIATION AND DEVIATION
C  [illegible]
C
        REAL AR(50,21)
        INTEGER IOBUF(100),OUTBUF(144),CBUF1(21),CBUF2(43)
C
C  WRITE OUT THE [illegible]
C
        CALL CODE
        WRITE(CBUF1,1010)
  1010  FORMAT([illegible]ATIONS I")
        CALL CODE
        WRITE(CBUF2,1020)(I,I=1,13)
  1020  FORMAT(1H ,13(2X,I4),"    TAU ")
        CALL WRITF(OUTBUF,IERR,CBUF1,21)
        IF(IERR [illegible]
        CALL WRIT[illegible]OUTBUF[illegible]43)
        IF (IERR LT.0) CALL ERR(IERR)
C
C  WRITE OUT THE DATA TO THE DISC
C
        DO  20  NT=1,50
            CALL CODE
            WRITE(IOBUF,120)(AR(NT,I),I=8,21)
  [illegible]       FORMAT(2H  [illegible]F6.3,F5.2,1H )
            CALL WRIT[illegible]
            IF ( [illegible]
   20       CONTINUE
            RETURN
            END
            END$
```

AD-A113 458 NAVAL RESEARCH LAB WASHINGTON DC F/G 13/12
NRL 324-CU M CHAMBER PRESSURIZATION EXPERIMENT: PRESSURANT CONC--ETC(U)
MAR 82 J P STONE, J I ALEXANDER, T T STREET
UNCLASSIFIED NRL-8523 NL

2 - 2

END
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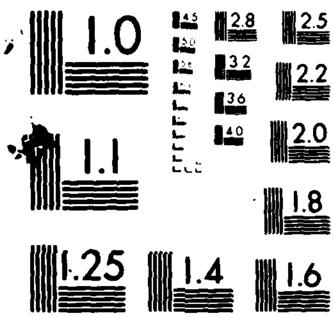

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

APPENDIX C

Program CINST accepts data from CINFR and produces the C-, D-, and E-tables [6].

```
&CINSP T=00004 IS ON CR00056 USING 00060 BLKS R=0000

FTN4
C
C    NOTE!!!! THIS IS A MODIFIED FORM OF CINST TO HANDLE LONGER DUMP
C    TIMES. IT DOES NOT CHANGE THE NONDIMENSIONAL TIME TAU AT 2.5.
       PROGRAM CINST(4,99), FWW VERSION 810213 MOD2
C
C
C  THIS PROGRAM DOES STATISTICS ON THE DATA FROM CINFR
C  THE RUNS FROM CINFR ARE GROUPED ACCORDING TO A PARTICULAR
C  TEST CONFIGURATION.  THE INPUT DATA IS FROM DISC FILES THAT
C  WERE CREATED FROM CINFR.  THE OUTPUT DATA FROM THIS PROGRAM
C  IS STORE IN DISC FILES AND MAYBE TRANSFERED TO MAGNETIC TAPE
C  WITH STORE COMMANDS FROM THE FILE MANAGER.
C
C
C  THIS PROGRAM WAS WRITTEN BY PROF. R. C. CORLETT, UNIV OF
C  WASHINGTON, SEATTLE WASHINGTON.
C  THIS PROGRAM WAS ADAPTED FOR USE ON THE NRL COMPUTER,CODE
C  6180 BY A. BRODER AND D. INDRITZ.
C  IT HAS BEEN COMMENTED BY F. W. WILLIAMS.
C  PROGRAM MODIFIED BY F.W.WILLIAMS 810404
C
C
      INTEGER INAME(3),ISIZE(2),OBUF(144),IBUF(144)
      INTEGER TBUF(144),ONAME(3),TNAME(3),IPAR(5)
      COMMON IPAR
      DATA TNAME/2HTN,2HPB,2HUF/
      DATA IBLANK/2H  /
      CALL RMPAR(IPAR)
      WRITE(IPAR,1)
1     FORMAT('CARTRIDGE #, INPUT FILE NAME :(I5,A6)')
      READ(IPAR,2)ICR,INAME
2     FORMAT(I5,1X,3A2)
      WRITE(IPAR,3)
3     FORMAT('CARTRIDGE #, OUTPUT FILE NAME :(I5,A6)')
      READ(IPAR,2)ICR2,ONAME
      ISIZE(1)=-1
      ITYPE=3
C
C  CREATE OUTPUT FILE
C
      CALL CREAT(OBUF,IERR,ONAME,ISIZE,ITYPE,IDUM,ICR2)
      IF(IERR.LT.0)CALL ERR(IERR)
C
C  OPEN INPUT FILE
C
      CALL OPEN(IBUF,IERR,INAME,[illegible],IDUM,ICR)
      IF(IERR.LT.0)CALL ERR(I[illegible]
C
C  CREATE TEMPORARY FILE FOR S.O.. [illegible]TERMEDIATE RESULTS
C  FROM CINAV
C
      CALL CREAT(TBUF,IERR,TNAME,ISIZE,ITYPE,IDUM)
      IF(IERR.LT.0)CALL ERR(IERR)
C
C  CINAV IS A SUBROUTINE WHICH INTERPOLATES THE DATA, CREATES A
C  NONDIMENSIONAL TIME AND NORMALIZES THE DATA TO IT.
C
```

```
 1000  FORMAT('GIVE CARTRIDGE #, NAME FOR INPUT FILE'
      1,'(I5,A6)')
       READ(IPAR(1),1002)ICR,NAME
 1002  FORMAT(I5,1X,3A2)
       WRITE(IPAR(1),1004)
 1004  FORMAT('GIVE CARTRIDGE #, NAME FOR OUTPUT FILE'
      1,'(I5,A6)')
       READ(IPAR(1),1002)ICR2,NAME2
       ISIZE(1)=-1
       ITYPE = 3
 C
 C     CREATE A DISK FILE
 C
       CALL CREAT(OBUF,IERR,NAME2,ISIZE,ITYPE,IDUM,ICR2)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
 C
 C     OPEN INPUT FILE
 C
       CALL OPEN(IBUF,IERR,NAME,IDUM,IDUM,ICR)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
 C
   10  DO 9 I=1,100
 C
 C     CONSTRUCT A LINE OF BLANKS
 C
    9  IOBUF(I) = IBLANK
       CALL READF(IBUF,IERR,A)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
 C
 C     CHECK FOR EOF
 C
       IF(A(1).EQ.XES)GO TO 9090
       CALL READF(IBUF,IERR,IOBUF)
       IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
       CALL CODE
       READ(IOBUF,20)NTI,NT,DT,TO,TP,AN,VT,CF,GA,WA,WP
 C
 C     DESCRIPTION OF VARIBLE MEANING
 C
 C     NTI= NO. OF THERMOCOUPLES, NT=NO. OF POINTS IN DATA TIME SERIES,
 C     DT=TIME SERIES NOMINAL INCREMENT (SEC), TO AND TP RESPECTIVELY
 C     EQUAL TIMES OF VALVE OPENING AND CLOSURE (SEC), AN=NOZZLE NOMINAL
 C     AREA (CM**2), VT=TANK VOLUME (M**3), CF=FLOW COEFFICIENT -
 C     IF CF IS INPUT AS ZERO AND NTI EXCEEDS 5 CF IS DEFAULT CALCULATED
 C     USING MEAN OF TC DATA AS ESTIMATE OF MEAN TANK TEMPERATURE,
 C     GA=SPEC. HEATS RATIO - IF INPUT AS ZERO ASSIGNED 1.4 DEFAULT,
 C     WA=MOL. WT. OF AIR,- IF INPUT AS ZERO ASSIGNED 28.97 DEFAULT,
 C     WP=MOL. WT. OF PRESSURANT - IF INPUT AS ZERO DEFAULT SET =WA.
 C
   20  FORMAT(2I4,9F7.3)
 C
 C     IF THERE ARE NO THERMOCOUPLES THE PROGRAM IS FINISHED
 C     AND A MESSAGE INDICATING COMPLETION WILL BE PRINTED
 C
       IF(NTI.GT.0.0)GO TO 30
       WRITE(IPAR(1),2000)NAME2
 2000  FORMAT ('AT THIS POINT CINFR IS FINISHED WITH ',3A2)
       STOP
 C
 C     INITIALIZING HEAT RATIO, MOL. WEIGHT OF AIR, AND
```

```
C      MOL. WEIGHT  OF PRESSURE TO DEFAULT IF APPROPRIATE
C
 30    IF(GA.EQ.0.0)GA=1.4
       IF(WA.EQ.0.0)WA=28.94
       IF(WP.EQ.0.0)WP=WA
C
C      WRITES TO LINE PRINTER
C
D      WRITE(6,40)NTI,NT,DT,TO,TP,AN,VT,GA,WA,WP
D40    FORMAT(1H120X14HPROGRAM CINFER/71H0 NTI   NT    DT     TO      TP
D     1     AN      VT      GA      WA      WP/1H I4,I5,F7.3,7F8.3)
C
C     IF NUMBER OF THERMOCOUPLES ARE  LESS OR EQUAL TO 5
C     OR IF FLOW COEFFICIENT EQUALS 0, PRINT MESSAGE INDICATING
C     SO AND ALSO PRINT A MESSAGE INDICATING PROGRAM IS
C     COMPLETED.
C
       IF(NTI.GT.5.OR.CF.NE.0.0)GO TO 60
       WRITE(IPAR(1),50)
 50    FORMAT(20H0NO FLOW COEFFICIENT)
       WRITE(IPAR(1),2000)NAME2
       STOP
C
C
C      PRINT OUT FLOW COEFFICIENT IF ANY
C
 60    IF(CF.NE.0.0)WRITE(IPAR(1),70)CF
 70    FORMAT(20H0FLOW COEF. INPUT ASF7.4)
C
C      PRINT OUT NUMBERS UP TO THE TOTAL NUMBER OF
C      THERMOCOUPLES
C
D      WRITE(6,80) (I,I=1,NTI)
D80    FORMAT(21H0RAW TIME SERIES DATA/30H   TIME   P     PS    TS    TI/
D     11H ,26X2HI=I1,8I5/1H ,I29,8I5)
       DO 100 J=1,NT
       RJ=J-1
       TIM(J)=RJ*DT
C
C      MUST BE MATED TO NRL DATA RECORD.
C
       CALL READF(IBUF,IERR,IOBUF)
       IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
       CALL CODE
       READ(IOBUF,90)P(J),PS(J),TS(J),(TI(I,J),I=1,NTI)
 90    FORMAT(F8.3,F7.3,14F5.1)
C
C      DESCIPTION OF VARIBLES
C      TIM=TIME(SEC), P=TANK PRESS. (ATM), PS=NOZZLE PRESS. (ATM),
C      TS=NOZZLE TOTAL TEMP. (DEG C), AND TI=TEMP. (DEG C) OF ITH TC.
C
D      WRITE(6,110)TIM(J),P(J),PS(J),TS(J),(TI(I,J),I=1,NTI)
D110   FORMAT(1H0,F6.2,2F6.3,F6.1,9F5.1/1H ,F29.1,8F5.1)
 100   CONTINUE
C
C
C      CONVERT TEMP. DATA TO DEG. K AND PRESS. DATA TO NEWTONS/M**2.
C
       DO 120 J=1,NT
       P(J)=P(J)*101322.0
```

```
      PS(J)=PS(J)*101322.0
      TS(J)=TS(J)+273.2
      DO 120 I=1,NTI
  120 TI(I,J)=TI(I,J)+273.2
C
C     CONVERT AN TO M**2, NOZZLE NOMINAL AREA
C
      AN=AN*0.0001
C
C     ALTER TIME SERIES TO INCLUDE TO AND TP.
C
      L=TO/DT
      L=L+1
      M=TP/DT
      M=M+1
      IF(M-L.GT.4)GO TO 140
C
C     IF (M-L) IS LESS OR EQUAL TO 4 PRINT OUT
C     MESSSAGE AND STOP PROGRAM
C
      WRITE(IPAR(1),130)
  130 FORMAT(52H0NOT ENOUGH FILLING DATA TO EVALUATE PRESSURANT FLOW)
      WRITE(IPAR(1),2000)NAME2
      STOP
C
  140 CONTINUE
D     DO 916 J=1,NT
D916  WRITE(6,917)TIM(J),P(J),PS(J),TS(J),(TI(I,J),I=1,NTI)
D917  FORMAT(1H0,F7.2,2F10.1,F7.1/1H ,13F7.1)
C
C     ADJUST TANK TEMPS. TO UNIFORM VALUE AT TIME TO.
C     CALCULATE MEAN TEMPERATURE.
C
      NTEF=NTI
      CNTI=NTEF
      TB(L)=0.0
      DO 160 I=1,NTI
C
      TB(L)=TB(L)+TI(I,L)/CNTI
  160 CONTINUE
      DO 170 I=1,NTI
      TCOR=TB(L)-TI(I,L)
      DO 170 J=1,NT
  170 TI(I,J)=TI(I,J)+TCOR
C
C     GAS CONST. RG (JOULE/KGM-MOL/DEG K) AND CRIT. PRESS. RATIO RP
C
      RG=8314.5
      RP=(2.0/(GA+1.0))**(GA/(GA-1.0))
C
C     CALCULATE NOMINAL FLOW INTEGRAL  ( ARRAY FLIN), MEAN TEMP. ( ARRAY TB),
C     AND NO. MOLES IN TANK (ARRAY CM).
C
      DO 190 J=1,NT
      PRAT=AMAX1(RP,P(J)/PS(J))
      VEL=SQRT(2.0*GA*RG/WP*TS(J)/(GA-1.0)*(1.0-PRAT**((GA-1.0)/GA)))
      DENS=PS(J)/RG/TS(J)*PRAT**(1.0/GA)
      FLIN(J)=AN*VEL*DENS
      TB(J)=0.0
      DO 180 I=1,NTI
```

```
            TB(J)=TB(J)+TI(I,J)/CNTI
      100   CONTINUE
C
            CN(J)=P(J)*VT/TB(J)/RG
D           WRITE(6,919)J,PRAT,VEL,DENS,FLIN(J)
D919        FORMAT(1H ,I5,4F15.4)
      190   CONTINUE
            IF(CF.NE.0.0)GO TO 240
C
C           CALCULATE FLOW DATA FROM NOMINAL MEAN TEMP. DATA (THAT IS, FROM
C           MEAN TC. DATA) AS ESTIMATE OF MEAN TANK TEMP. (INPUT VALUE OF CF
C           IS ZERO.) THIS IS BETWEEN TO AND TP.
C           EVALUATE FLOW INTEGRAL FLINT.
C
            FLINT=0.0
            N1=N-1
            DO 200 J=L,N1
      200   FLINT=FLINT+(FLIN(J)+FLIN(J+1))/2.0*(TIN(J+1)-TIN(J))
            CF=(CN(N)-CN(L))/FLINT
D           WRITE(6,210)CF
D210        FORMAT(4H0CF=F6.4,61H -INFERRED USING MEAN OF TC. DATA TO APPROX.
D          1 MEAN TANK TEMP.)
C
C           DEVELOP CONSISTENT VALUES FOR MEAN TEMP. TB AND NO. MOLS. CN
C           FOR NON-FILLING PERIODS.
C
            DO 220 J=1,L
            CN(J)=CN(L)
      220   TB(J)=P(J)*VT/CN(J)/RG
            DO 230 J=N,NT
            TBJ=0.0
            DO 225 I=1,NTI
            TBJ=TBJ+TI(I,J)/CNTI
      225   CONTINUE
            CN(J)=CN(N)
            TB(J)=P(J)*VT/CN(J)/RG
            DO 228 I=1,NTI
      228   TI(I,J)=TI(I,J)+TB(J)-TBJ
      230   CONTINUE
            GO TO 260
C
C           INTEGRATE FLOW INTO TANK USING INPUT VALUE OF CF.
C
      240   DO 250 J=1,NT
            IF(J.LT.L)CN(J)=CN(L)
            IF(J.GT.L.AND.J.LE.N)CN(J)=CN(J-1)+CF*(FLIN(J-1)+FLIN(J))/2.0*(TIN
           1(J)-TIN(J-1))
            IF(J.GT.N)CN(J)=CN(N)
      250   TB(J)=P(J)*VT/CN(J)/RG
C
C           INTEGRATION OF TAIR AND TPRS
C
      260   CONTINUE
D           WRITE(6,270)L,N
D270        FORMAT(50H1SUMMARY OF CALCULATIONS THRU ARRAYS TAIR AND TPRS/3H J=
D          1I2,2X6HAND N=I3/50H0  J   TIME   TAIR   TPRS  TSTAR   BETA   XPBAR
D          2 BETA/TSTAR/)
D280        FORMAT(1H ,I3,5F7.1,F8.3,E10.2)
            NTM1=NT-1
            DO 460 J=L,NTM1
```

```
      T1=TB(L)
      TAIR(J)=T1
      TPRS(J)=TS(L)
      TSTAR=CN(L)/(CN(L+1)-CN(L))
      IF(J.GT.L.AND.TB(J).GT.T1)GO TO 420
      TB2=T1
      TA2=T1
      TS2=TS(J)
      P2=P(J)
      CN2=CN(J)
      GM1=GA-1.0
      DLTP=(TB(J+2)-T1)/(0.5*(TB(J+2)+T1))/ALOG(P(J+2)/P(L))
      CNU2=GM1*T1/(GA*(T1-TS(L))+GA*TS(L)-T1)
      BTA(J)=(1.D0*GA*TS2-TB2-CN2*1.D0*(TB(J+2)-T1)/(CN(J+2)-CN(L)))/
     1(GM1*1.D0*0.5*(TB(J+2)-T1))
D     WRITE(6,410)J,DLTP,CNU2
D410  FORMAT(3H0J=I3,10X5HDLTP=F6.3,10X4HCNU=F6.3)
      GO TO 450
 420  TB1=TB2
      TS1=TS2
      P1=P2
      CN1=CN2
      TA1=TA2
      CNU1=CNU2
      TS2=TS(J)
      TB2=TB(J)
      P2=P(J)
      CN2=CN(J)
      TBB=0.5*(TB1+TB2)
      TSB=0.5*(TS1+TS2)
      PB=0.5*(P1+P2)
      CNB=0.5*(CN1+CN2)
      TAB=TA1
      CNUB=CNU1
      DP=P2-P1
      DN=CN2-CN1
      DTB=TB2-TB1
      FI=.FALSE.
 430  DTA=GM1/GA*TAB*DP/PB-CNUB/GA*((GA*TSB-TBB)/CNB*DN-DTB)
      TA2=TA1+DTA
      TAB=0.5*(TA1+TA2)
      CNU2=(TA2-T1)/(TB2-T1)
      CNUB=0.5*(CNU1+CNU2)
      IF(FI)GO TO 440
      FI=.TRUE.
      GO TO 430
 440  TAIR(J)=TA2
      IF(J.LE.N-2)TSTAR=CNB/DN*DT
      BTA(J)=((1.D0*GA*TSB-TBB)*DN/CNB-DTB)/GM1/(TBB-T1)*TSTAR/DT
      TPRS(J)=(CN2*TB2-CN(L)*TA2)/(CN2-CN(L))
      TSAV=0.5*(TS2+TS(L))
      IF(TPRS(J).GE.TSAV)GO TO 445
      TPRS(J)=TSAV
      TAIR(J)=TSAV+CN2/CN(L)*(TB2-TSAV)
 445  CONTINUE
D     WRITE(6,448)J,TB1,TS1,P1,CN1,TA1,CNU1,TB2,TS2,P2,CN2,TA2,CNU2,TBB,
D    1TSB,PB,CNB,TAB,CNUB,DP,DTB,DN,DTA,DT,TSTAR,TAIR(J),TPRS(J),BTA(J),
D    2TSAV
D448  FORMAT(3H0J=I3,10X17HTB,TS,P,CN,TA,CNU/
D    15X1H1,2F8.1,F8.0,F8.4,F8.1,F8.4/
```

```
D     25X1H2,2F8.1,F8.0,F8.4,F8.1,F8.4/
D     35X1H8,2F8.1,F8.0,F8.4,F8.1,F8.4/
D     44H DP=F8.0,5X4HDTB=F8.1,5X3HDH=F8.4,5X4HDTA=F8.1,5X3HDT=F6.3/
D     57H TSTAR=F8.1,5X5HTAIR=F8.1,5X5HTPRS=F8.1,5X5HBETA=F8.1,5X5HTSAV=F
D     68.1)
  450  XPB(J)=0.0
       IF(TAIR(J).NE.TPRS(J))XPB(J)=(TAIR(J)-TB(J))/(TAIR(J)
      1-TPRS(J))
       BTTS(J)=BTA(J)/TSTAR
D      WRITE(6,280)J,TIN(J),TAIR(J),TPRS(J),TSTAR,BTA(J),XPB(J),BTTS(J)
  460  CONTINUE
C
       DO 926 J=1,NT
D      WRITE(6,925)TIN(J),TB(J),CH(J),(TI(I,J),I=1,NTI)
D925   FORMAT(1H0,F10.3,F10.2,F15.4/(1H ,7F10.2))
  926  CONTINUE
C
C      CALCULATION AND DISPLAY OF PRESSURANT FRACTIONS
C
  800  CALL CODE
       WRITE(IOBUF,802)(A(I),I=1,10)
  802  FORMAT(36H1INFERRED PRESSURANT DISTRIBUTION - ,10A4)
       CALL WRITF(OBUF,IERR,IOBUF,38)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
       CALL WRITF(OBUF,IERR,CBUF1,32)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
       CALL CODE
       WRITE(IOBUF,803)(I,I=1,13)
  803  FORMAT(28H (SEC)  MEAN  AIR PRESSURANT,20X9HMEAN I = I1,12I6)
       CALL WRITF(OBUF,IERR,IOBUF,65)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
C      CONSTRUCT A LINE OF BLANKS
C
       DO 804 I=1,100
  804  IOBUF(I) = IBLANK
C
C
  806  FORMAT(1H ,F5.1,3F6.1,F8.1,F8.4,F12.3,F6.3,12F6.3)
       TME=0.0
       XPI=0.0
       TB(L)=TB(L)-273.2
       CALL WRITF(OBUF,IERR,CBUF3,12)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
       CALL CODE
       WRITE(IOBUF,806)TME,TB(L),TB(L),BTA(L),BTTS(L),XPB(L),(XPI,I=1,13)
       CALL WRITF(OBUF,IERR,IOBUF,66)
       IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
C     NOTE!!!! THIS HAS TO BE CHANGED TO COINCIDE WITH WHAT IS AVAILABLE
C      IN SCANS AND WHAT CINST IS EXPECTING. THE KB=L+100  THE 100 HAS TO
C      BE CHANGED.
C
C
       KA=L+1
       KB=L+100
C
       DO 850 K=KA,KB
       TME=TIN(K)-TIN(L)
C
```

```
      DO 830 I=1,13
      XP(I)=0.0
      IF(TAIR(K).NE.TB(K))XP(I)=1.D0*XPB(K)*(TAIR(K)-TI(I,K))/
     1(TAIR(K)-TB(K))
  830 CONTINUE
      TB(K)=TB(K)-273.2
      TAIR(K)=TAIR(K)-273.2
      TPRS(K)=TPRS(K)-273.2
      IF(K.NE.L+2)GO TO 831
      CALL WRITF(OBUF,IERR,CBUF4,9)
      IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
  831 IF(K.NE.M-2)GO TO 832
      CALL WRITF(OBUF,IERR,CBUF5,12)
      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
  832 IF(K.NE.M)GO TO 833
      CALL WRITF(OBUF,IERR,CBUF6,10)
      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
  833 CALL CODE
      WRITE(IOBUF,806)TME,TB(K),TAIR(K),TPRS(K),BTA(K),BTTS(K),XPB(K),
     1(XP(I),I=1,13)
      CALL WRITF(OBUF,IERR,IOBUF,66)
  850 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
CC    CALL WRITF(OBUF,IERR,CBUF2,61)
CC    IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
C
C     RETURN TO BEGINNING OF PROGRAM
C
      GO TO 10
C
C     CONSTRUCT LINE OF BLANKS
C
 9090 DO 9091 I=1,100
 9091 IOBUF(I)=IBLANK
C
C     CHECK FOR EOF MARKER
C
      CALL WRITF(OBUF,IERR,XES,2)
      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
      DO 9092 I=1,4
      CALL WRITF(OBUF,IERR,IOBUF,100)
 9092 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
C     DETERMINE THE ACTUAL LOCATION OF THE RECORD POINTS
C
      CALL LOCF(OBUF,IERR,IDUM,IRB,IDUM,ISEC)
      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
      ITRUN = ISEC/2 - (IRB - 1)
C
C     CLOSE THE DISK FILE
C
      CALL CLOSE(OBUF,IERR,ITRUN)
      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
C
C     PRINT ENDING MESSAGE
C
      WRITE(IPAR(1),2000)NAME2
      STOP
      END
```

```
C
C************************************************************
C SUBROUTINE TO PRINT OUT FMP ERRORS AS THEY OCCUR
C FMP ERROR DESCRIPTIONS ARE LOCATED IN 'RTE 4B
C PROGRAMMERS' RET SPOOLING MANUAL'
C
      SUBROUTINE ERR(LU,IERR)
      INTEGER LU,IERR
      WRITE(LU,10)IERR
   10 FORMAT(' IERR = ',I6)
      STOP
      END
C***********************************************************
      END$
```